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THE PREPARATION OF OCCUPATIONAL INSTRUCTORS, A SUGGESTED
COURSE GUIDE.

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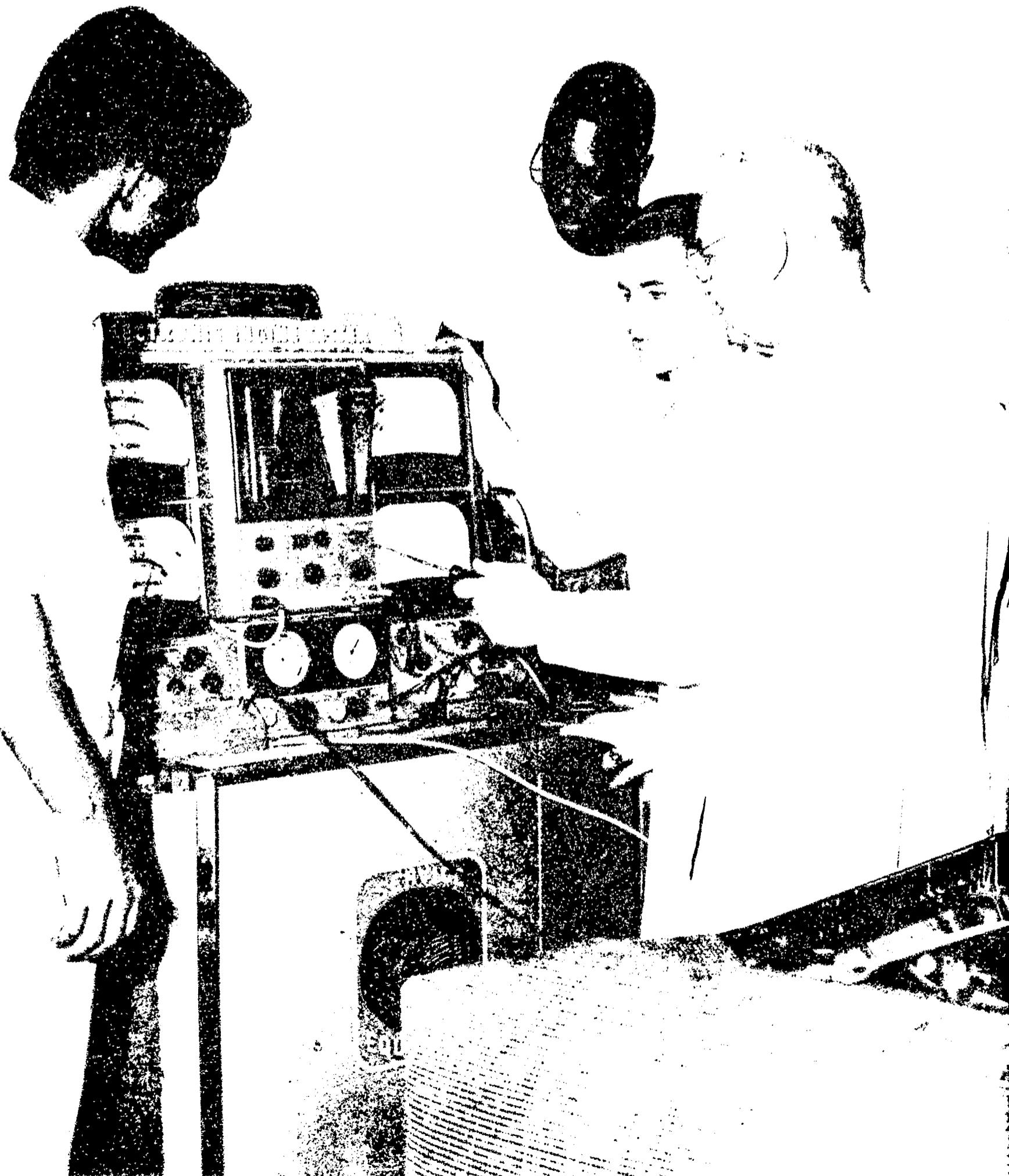
LESSON PLANS, GUIDES, AND HANDOUT SHEETS ARE CONTAINED
IN THIS MANUAL FOR USE BY VOCATIONAL TEACHER TRAINERS IN
PREPARING OCCUPATIONALLY COMPETENT INDIVIDUALS FOR TEACHING
VOCATIONAL SUBJECTS. IT WAS WRITTEN BY AN INDIVIDUAL, UNDER
THE DIRECTION OF TEACHER EDUCATORS, PURSUANT TO A U.S. OFFICE
OF EDUCATION (USOE) GRANT. THE CONTENT TREATS TEACHING,
LEARNING, EVALUATION, TESTING, ORGANIZATION, AND MANAGEMENT
BY MEANS OF LESSON PLANS, INSTRUCTOR'S GUIDE SHEETS, HANDOUT
SHEETS, AND SAMPLE SHEETS. FOUR-STEP LESSONS ON SPECIFIC
SUBJECTS ARE ALTERNATED WITH THE TEACHING DEMONSTRATIONS,
PERMITTING STUDENTS TO APPLY WHAT THEY HAVE LEARNED AS THE
COURSE PROCEEDS. IT IS RECOMMENDED FOR A CLASS OF TEN AND
SHOULD REQUIRE 20 HOURS, ALLOWING FOR ONE 30-MINUTE
DEMONSTRATION BY EACH STUDENT. TEACHER EDUCATORS SHOULD
FAMILIARIZE THEMSELVES WITH THE MANUAL IN A WORKSHOP OR
TRAINING INSTITUTE. IT WAS PREPARED FOR USE WITH OCCUPATIONAL
INSTRUCTORS WHO MUST TEACH WITH A MINIMUM OF PREPARATION.
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the preparation of Occupational Instructors

A SUGGESTED COURSE GUIDE

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THE PREPARATION OF
OCCUPATIONAL INSTRUCTORS

A Suggested Course Guide

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education, Division of Vocational and Technical Education
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FOREWORD

Intensified efforts to provide occupational training for unemployed or under-employed people in the United States have accelerated the need for competent, skillful instructors in vocational fields. Vocational teacher trainers can help meet this need by conducting intensive "how to teach" courses to prepare occupationally competent individuals for teaching vocational subjects.

Through the years many courses for instructors have been developed by various states. Successfully developed ideas and materials and the experiences gained by the states have been brought together in this manual. Its purpose is to provide teacher educators and supervisors with well-planned basic course material for occupationally competent workers who may be selected to teach in vocational and technical programs throughout the nation. The Introduction will be helpful in understanding the makeup of the manual. Careful study of the typographical code will assist teacher educators to grasp more quickly the author's layout of the manual and to apply the teaching principles involved.

A national committee consisting of outstanding teacher trainers was consulted to suggest a course outline and to recommend content material. This committee also reviewed the manual. Only with the help of such a group could this manual have been prepared. The committee was composed of:

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This guide was prepared by the Industrial Education Department, Division of Extension, The University of Texas, Austin, under a contract with the U.S. Office of Education. The manuscript was written by James L. Cockrum under the direction of James R. D. Eddy, Dean, Division of Extension, and Director, Industrial and Business Training Bureau; Arthur J. Edwards, Assistant Director of Industrial Education; and Charles Cyrus, Training Specialist, Industrial Education. Special recognition is due James H. Frazier and John Bagnall, Teacher Trainers, Industrial Education Department, who reviewed the manuscript prior to publication.

It is suggested that teacher educators, through workshop and institute programs, develop skill in the use of the course manual.

**Walter M. Arnold
Assistant Commissioner of
Vocational and Technical Education**

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INTRODUCTION

This manual contains the lesson plans, guides, and handout sheets required by a teacher trainer to teach a basic course in training techniques for the occupational instructor who must begin his assignment with a minimum of preparation. It is anticipated that the occupational instructor will be competent in an occupation for which immediate training needs must be met. In many cases it is not possible for such instructors to complete the longer training courses now being offered for more permanent instructors of occupational courses.

Course Outline and Content

Following sound training principles, this course provides an opportunity for each prospective occupational instructor to present a demonstration lesson and to benefit from evaluation of his performance. Four-step lessons on specific subjects are alternated with the teaching demonstrations, permitting the occupational instructors to apply what they have learned as the course proceeds.

If a recommended class size of 10 occupational instructors is maintained, the course should require 20 hours, including approximately 30 minutes for one demonstration lesson by each occupational instructor.

Class times suggested are:

One-half hour for Unit I, Orientation. This is intended primarily to motivate the occupational instructors by explaining the program in which they are involved and why they are personally important to its success. More time might be required to meet specific local needs for orientation.

Fifteen hours for Unit II, Teaching and Learning. This unit covers the four-step plan of instruction, principles of learning, oral questioning, teaching related information, advantages and use of group and individual instruction, and the use and characteristics of teaching aids. Intentionally, some teaching points are made several times in separate lessons to reinforce learning. A checklist is provided for the occupational instructors to use in evaluating practice teaching demonstrations.

Two and one-half hours for Unit III, Testing and Evaluation. In this unit the occupational instructors learn some objectives and principles of testing and actually construct tests for evaluating skills and related information.

Two hours for Unit IV, Organization and Management. This unit is primarily to inform occupational instructors about nonteaching responsibilities they may

face as occupational instructors. Of necessity, it is general in nature. In some programs it may be desirable to include or substitute more specific information.

Content

This book includes several types of material:

Lesson plans are provided for the teacher trainer when presenting four-step lessons to help him set a good example of sound training procedures.

Instructor's guide sheets are provided for conducting practice teaching demonstrations.

Handout sheets are included and should be given to individual trainees during each lesson. Handout material includes both information and assignment sheets. They can be reproduced locally.

Sample sheets are provided for local reproduction. These are included in lessons where it is not practical to put enough copies of a form in the book itself. There are sample sheets showing formats for a recommended lesson plan and for a job breakdown sheet, and one sample sheet showing the evaluation form, "Check Sheet for Practice Teaching," which is to be used with demonstration lessons given by the trainees.

Typographical Code

The following typographical code will aid the teacher trainer using the lesson plans:

1. Words completely in capital letters are to be emphasized, usually by writing on chalkboard; for example: The words TELLING IS NOT TEACHING would be put on the chalkboard.
2. Words are underlined to indicate that they should be stressed without placing on chalkboard; for example: This is how I should teach.
3. Teaching aids are referred to by number or letter; for example: Handout Sheet 2 or Sample Sheet D.
4. Instructions to the teacher trainer are enclosed in brackets; for example: [Discuss four-step plan. Distribute Handout Sheet 2. SHOWING IS NOT TEACHING.]

5. The lesson plans are not intended to provide the exact wording to be used by the teacher trainer. They indicate approximately what the instructor should say; for example:

II. PRESENTATION of information

A. Principles of learning

1. Readiness-- Learner must have a need for acquiring specific information or skill. [READINESS]
2. Effect--Learner must gain satisfaction from the effects of learning; he must experience success. [EFFECT]
3. Practice--Learner must apply what he is learning for it to become permanent. [PRACTICE]

B. Four-step plan

[Distribute Handout Sheet 2.]

1. Step I, Preparation--Apply the principle of readiness. Learner must be convinced of need to learn.

[READINESS--STEP I, PREPARATION]

6. In Step III, Application, answers to questions are indented under the questions.

OUTLINE FOR UNIT I, ORIENTATION

(Recommended time: One-half hour in one session)

	<u>Page</u>
Lesson Plan, Act Under Which Course Is Given; Summary of Course Content	7

INSTRUCTOR'S LESSON PLAN

SUBJECT: Act under which course is given; summary of course content

AIMS: To teach the basic objectives of the course. To emphasize that the instructor is a key factor in training success. To stress that this teacher training course is vital to the success of the instructor. To point out that resources and resource people are available for assistance.

HANDOUT SHEET: Handout Sheet 1

I. PREPARATION of learner

You were hired because you possess the technical information and the skills of the occupation you will teach. This course is provided so that you can develop the equally important skills and knowledge of teaching. You must possess both occupational and teaching abilities in order to do a good job with the trainees sent you.

II. PRESENTATION of information

A. Historical background

1. Throughout history, training for gainful occupations has been provided through formal and informal efforts of families, guilds, unions, businesses, and governments.
2. The United States has long recognized that such training benefits the nation as a whole and is a national responsibility, but planning and providing such training has been done by the States. In the

past, States that conducted training have been assisted by U. S. funds provided for specified purposes under (1) Smith-Hughes Act, enacted in 1917; and (2) George Barden Act, enacted in 1946. Under these two acts, assistance was given in training persons over 14 years of age in agricultural, industrial, distributive, and home economics occupations. State and local money has been matched dollar for dollar by the federal government. Full-time training and part-time training after the workday have been available both for people wanting to enter an occupation and those needing to improve their abilities.

3. In recent years there has been a great increase in the need for training people to enable them to enter gainful occupations. These new acts have been passed:

B. Act under which this training is given

[This space is for teacher's notes. It is suggested that he emphasize factors of the act which most directly affect trainees.]

C. Objectives of the individual instructor

The person who instructs in occupational training will need:

1. To teach the trainee skills required to get and hold a job. [SKILLS]
2. To teach the trainee information required to perform the skills successfully and safely. [INFORMATION]
3. To help the trainee develop an attitude that will ensure continued employment. [ATTITUDE]

D. Content of course

To help the instructor meet those objectives, this course will cover the following:

1. HOW ADULTS LEARN; HOW THEY DIFFER, AND HOW THEY ARE THE SAME; HOW TO AROUSE AND MAINTAIN THEIR INTEREST.

2. HOW TO DIVIDE AND ARRANGE THE SKILLS AND INFORMATION OF AN OCCUPATION SO THEY CAN BE TAUGHT MOST SUCCESSFULLY.
3. HOW TO USE A BASIC FOUR-STEP PLAN FOR EACH LESSON.
4. HOW TO USE CERTAIN METHODS AND TECHNIQUES WHICH MAKE IT EASIER FOR A TRAINEE TO LEARN.
5. PROCEDURES NEEDED TO OPERATE A PROGRAM, INCLUDING MANAGEMENT OF SHOP AND CLASSROOM.
6. STUDENT CHARACTERISTICS AND CONDUCT THAT CAN BE EXPECTED.
7. RULES AND POLICIES OF THE PARTICULAR TRAINING PROGRAM IN WHICH THE INSTRUCTOR WORKS OR HOW HE CAN FIND OUT THE RULES THAT AFFECT HIS WORK.

[Distribute Handout Sheet 1.]

E. Routine of course

This course will give the beginning instructor an opportunity to try out the knowledge offered. Every trainee will present a sample lesson and do other exercises needed to develop some competence as an occupational instructor.

[At this time the teacher trainer may wish to work out or discuss details of scheduling for the course.]

III. APPLICATION of information

[Ask the group the following questions, giving one or more individuals an opportunity to answer.]

1. What does an occupational instructor teach to trainees?
The skills, information, and attitudes necessary to get and keep a job in a specific occupation.
2. What does an instructor need to know in order to meet his objective of effective teaching?

How adults learn; how to motivate them; how to organize skills and information so they can be taught most successfully; a four-step plan of instruction, certain teaching methods and techniques; how to manage a shop and classroom; learner characteristics and conduct to expect; rules and policies of the particular act and local program.

[Note: The teacher trainer may also wish to ask questions about pertinent acts.]

IV. TEST

[Have trainees write brief answers to these questions.]

1. Why are skills, information, and proper attitudes all important to a trainee?
All will be needed by the trainee to get and hold a job.
2. List five types of information that the instructor may need to know if he is to succeed in teaching an occupation.
Same as Question 2 in III, Application.

[Additional questions may be asked about the act under which this teacher training or occupational training is being given.]

WHAT AN INSTRUCTOR NEEDS TO KNOW ABOUT INSTRUCTING

If you are going to help a person acquire the skills, knowledge, and attitudes he needs to get and keep a job, you will need to know:

How adults learn.

How you can make them want to learn.

What you can do in your planning and teaching to help them learn more effectively.

How to manage a class and shop area so it will contribute to successful teaching.

Where you can get assistance and advice.

If you are a beginning teacher, you should recognize the difference between the production goal in your regular occupation and effective instruction as a teacher:

When You Produce

1. Your interest is in the finished product.
2. You do the work.
3. You work with standard materials.
4. You follow the most efficient way to produce.
5. Quality and quantity at minimum costs are the tests of proficiency.

When You Instruct

1. Your interest is in the trainee; the product is secondary.
2. The job is divided between the instructor and the trainee, depending on how rapidly the trainee is catching on.
3. The trainee works on any suitable material.
4. You teach the steps in the way the trainee can best learn them.
5. Ability to perform is the test.

OUTLINE FOR UNIT II, TEACHING AND LEARNING

(Recommended time: 15 hours in six sessions, all times approximate)

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<u>Session One (3 hours)</u>	
Lesson Plan, Teaching and Learning (90 minutes)	15
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INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Teaching and learning

AIMS: To show that effective teaching is based on the principles of learning.

To give the prospective occupational teacher a firsthand understanding of how his learners will react to incorrect teaching techniques--telling used alone and showing used alone--as compared to a four-step approach that uses the principles of learning as its basis.

MATERIALS: Teaching Aid 1. For each trainee, ten 5" x 8" paper sheets, 28-pound or equivalent, for folding sign-writer's cup. Paper for short written test in Step IV.

I. PREPARATION of learner

Teaching and learning are parts of a cooperative process. The teacher must understand his learners and how they will respond to various teaching techniques. This lesson attempts to show you the most effective teaching approach.

II. PRESENTATION of information

1. Readiness--Learner must have a need for acquiring specific information or skill.
2. Effect--Learner must derive satisfaction from the effects of learning; he must experience success.
3. Practice--Learner must apply what he is learning for it to become permanent.

B. Principles of learning used in a four-step plan of instruction

1. Step I, PREPARATION of learner--Apply the principle of READINESS. The learner must be convinced of the need to learn.
2. Step II, PRESENTATION--Apply the principle of EFFECT. Proper presentation helps the learner experience success.
3. Step III, APPLICATION or tryout performance--Apply the principle of PRACTICE. Practice helps make learning permanent.
4. Step IV, TEST or follow -up--Follow up to determine if learner has succeeded and is ready for the next lesson.

C. Ineffective teaching approaches

1. TELLING USED ALONE--[Pass out one 5" x 8" sheet to each trainee. Tell trainees how to fold cup, using Teaching Aid 1 as your guide. Do not demonstrate. Ask those who succeed if past experience helped. Ask others how they feel about failure in such a simple task. Stress that telling is ineffective used alone, tends to destroy confidence and interest. TELLING IS NOT TEACHING. Take up materials; do not leave with trainees.]
2. SHOWING USED ALONE--[Pass out additional 5" x 8" sheets. Show the learners how to fold a sign-writer's cup without explaining each step and key points. Stress that showing used alone is ineffective and also tends to destroy confidence and interest. SHOWING IS NOT TEACHING. Pick up materials.]

D. An effective approach to teaching

1. An effective method of teaching is to use SHOWING PLUS TELLING--DEMONSTRATION--within a FOUR-STEP PLAN. This is how folding the sign-writer's cup should be taught.
2. [Select two or three volunteers to learn the job. Have entire group observe, noting how principles of learning are applied. Use following procedure in teaching.]
3. Step I, PREPARATION--We have an order for 10,000 sign-writer's cups to fill by the 18th. The deadline can't be met unless you learn to do this job rapidly and correctly. Have any of you produced these cups before? Do you know what the cups are for? They hold small amounts of paint while signs are being painted. You must meet

this standard of quality. [Show a satisfactory sample cup.] Can you all see me clearly?

4. Step II, PREPARATION--Tell and show how to fold a cup step by step, explaining every key point. Repeat the demonstration.
5. Step III, APPLICATION or tryout performance--Help each learner make a cup. Stop anyone immediately if he uses incorrect procedure, and reteach. As necessary, repeat demonstrations of steps or explanations of key points. Let learners practice until they can do the job correctly.
6. Step IV, TEST or follow-up--Have each trainee make several cups and check each for acceptability.

E. Comparison of the three approaches

1. Telling is not teaching because words mean different things to different people, because this method appeals to sense of hearing only, and because probable failure destroys confidence and interest.
2. Showing is not teaching because it appeals to sense of sight only and, like telling used alone, destroys confidence and interest.
3. Demonstration within a four-step plan is good teaching. [Recall how it felt to fail and the effect it had on learning. Ask trainees to compare their feelings after succeeding, the result of being properly taught.]

F. Principles of learning applied in the four-step plan for sign writer's cup

1. Because a learner has to see a need for learning, the aim of the lesson was emphasized.
2. Because a learner needs to experience success, his chances for succeeding were increased by making use of both seeing and hearing by breaking material into small, easy-to-master steps.
3. Because a learner has to use what he is learning to make it permanent, each trainee was given the chance to apply what he was being taught.

III. APPLICATION of the information [Oral Questions]

1. What are the three principles of learning identified in this lesson?
Readiness, effect, and practice
2. What do these three principles of learning mean?
Readiness--learner must be prepared for the lesson. Effect--learner must get satisfaction or success from the lesson. Practice--learner must repeat the thing taught him several times to ensure learning.
3. How effective is telling alone in teaching?
Poor
4. How effective is showing alone in teaching?
Poor
5. What effect does failure have on a person?
Hinders learning and destroys confidence and interest
6. Why should lessons follow a plan of instruction?
To help the instructor teach more effectively
7. What are the four steps in the four-step plan of instruction?
Step I, Preparation of Learner; Step II, Presentation; Step III, Application or Tryout Performance; Step IV, Test or Follow-up

IV. TEST [Written]

1. Briefly define the three principles of learning.
Readiness--Learner has to be ready to learn, to be convinced it is desirable.
Effect--Learner has to get satisfaction from lesson, needs to be successful.
Practice--Learner has to do the thing taught him several times to make learning permanent.
2. List the four steps of the four-step plan. Tell which principle of learning applies to each of the first three steps.
Step I, Preparation--readiness
Step II, Presentation--effect
Step III, Application--practice
Step IV, Test or Follow-up

SUGGESTIONS ON HOW TO MAKE THE SIGN-WRITER'S CUP

Here is a pictorial description of the cup for your own use in becoming completely familiar with it. It is not for handing out in the meetings.

Steps in the Operation

1. Make crosswise creases.

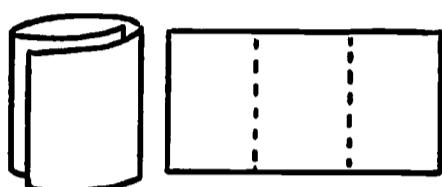


Fig. 1

Key Points

1. Roll into cylinder, matching ends. Divide card into three equal parts. Do not crease with fingernails.

2. Make lengthwise creases.

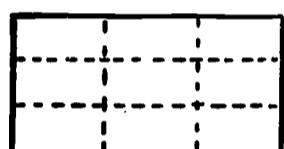


Fig. 2

2. Hollow sides of creases on same side.

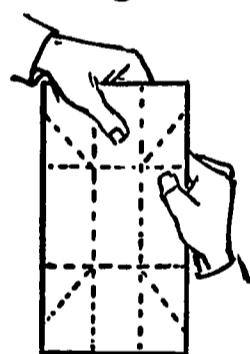


Fig. 3

3. Fold the diagonal creases at corners.

3. One corner at a time. Match corner creases. Corner folds away. Diagonal crease starts at point where the corner creases join.

4. Fold the ends of the cup.

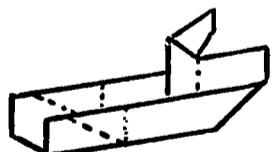


Fig. 4

4. Around end of cup--not sides. Corners overlay evenly. Corners square.

5. Fold the flaps down.

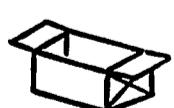


Fig. 5

5. Flaps bend out in line with top of cup.

SESSION ONE
Part 2 of 2
90 minutes

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Planning a four-step lesson

AIMS: To help the new instructor develop a lesson he will be required to teach.
To train him to use the job breakdown sheet and the type of lesson plan intended for his skill or information lesson.

MATERIALS: For each trainee, one copy each of Handout Sheets 2, 4, 5, and 6; four job breakdown sheets reproduced locally following format of Sample Sheet A; four lesson plan sets for each trainee, reproduced locally following format of Sample Sheet B (for manipulative skills) and Sample Sheet C (for related technical information). Sample sheets are at the end of this lesson.

I. PREPARATION of learner

This lesson has three objectives: First, to help you learn in greater detail what is done in each of the four steps; second, to teach you how to use two planning aids, the job breakdown sheet and the lesson plan; and third, to provide time and assistance for planning the lesson you will teach in applying the information you are being taught. As the principle of practice stresses, application is necessary to make learning permanent.

II. PRESENTATION of information

A. Detailed procedures for using four-step plan

1. The previous lesson covered use of principles in four-step plan, as well as the basic purpose of each step. [Distribute Handout Sheet 2.] But to apply the four-step plan, the teacher must do several things within each step. The small card reproduced on Handout Sheet 2 outlines in detail the actions in each step.

2. Step I, Prepare [Using "How To Instruct" card as a guide, discuss each point listed for Step I.]
3. Step II, Present [Discuss each point for this step.]
4. Step III, Try Out Performance [Discuss each point for step.]
5. Step IV, Follow-up or Test [Discuss each point for step.]

B. Getting ready to instruct--have a timetable

1. Decide what is to be taught.
2. Establish a timetable for teaching which will accomplish course objectives. This will help determine how much time to devote to each lesson.

C. Getting ready to instruct--break down the job

1. The learner will not be able to master a complex or difficult job unless it is broken down into understandable parts. Success of the teacher in breaking down a job is a key factor in the effectiveness of instruction.
2. Parts of a job--The sign-writer's cup was relatively simple and could be divided into a few steps. Other jobs, like tuning an automobile engine, may require a number of complex procedures called operations. Each operation is accomplished by a series of steps. The steps in a relatively simple job or in an operation are the parts of the breakdown made by the instructor for teaching purposes.
3. Job breakdown sheet--[Refer to Handout Sheet 3.] This sheet can be used when breaking down jobs or operations. Left column is for listing steps which advance job or operation toward completion. Right column is for listing key points--things which worker must understand and accomplish to do a step correctly, safely, and efficiently.

[Distribute Handout Sheet 4 and discuss it.]

4. Making a breakdown--[Give each trainee four copies of the job breakdown sheet form, Sample Sheet A. Do job of folding sign-writer's cup and have them list each step and key point on a job breakdown sheet. Compare results with Handout Sheet 3.]

5. Importance of breakdown--An attempt to teach without a breakdown is more or less futile for both you and your learners.
 - a. The breakdown assures you that nothing has been omitted.
 - b. The breakdown helps you simplify teaching of the operation.
 - c. The breakdown keeps you from adding nonessentials and saves time and effort.
 - d. The breakdown provides a continuous plan to be used and improved for future lessons.

D. Getting ready to instruct--make a lesson plan

1. Purpose--It is possible to teach from a job breakdown sheet, but use of a lesson plan will help ensure that the four-step plan is carried out completely and effectively. Steps in job breakdown are transferred to lesson plan.
2. Parts of a lesson plan sheet--[Pass out lesson plan sheets, four sets of each type to each trainee. Explain headings on each type of sheet. See Sample Sheets B and C.]

E. Getting ready to instruct--have everything ready

1. Reason--When an instructor has to stop during a lesson to obtain needed items, the preparation step may be ineffective. Wasted time and discipline problems usually result.
2. Making a list will help ensure having everything. Also, a practice performance before actually giving the lesson will help check for complete materials and lesson content.

F. Getting ready to instruct--arrange workplace

The workplace should be arranged as you expect trainees to keep it. Require that it be kept clean and orderly. Lay out all equipment, materials, and supplies in the order you will use them when conducting the lesson. Explain arrangements to trainees if necessary.

G. Trainee preparation for demonstration lesson

1. Every trainee will present a demonstration lesson, and the entire group will evaluate each lesson. There is no reason to be

embarrassed, and both demonstrations and evaluations will help you learn how to teach.

2. This job breakdown should be followed in getting ready for and conducting practice teaching demonstrations. [Distribute Handout Sheet 5.]
3. A demonstration lesson can teach either skill or information. It should be from the occupation which the trainee will teach later; however, Handout Sheet 5 has a list of possible topics that could also be suitable.
4. Time for presenting each demonstration will be approximately 20 minutes, so a lesson must not cover too much ground.
5. There will be time in the application step of this lesson for each trainee to work on job breakdowns and lesson plans. An original and one copy of each sheet should be made.

III. APPLICATION of information [Oral Questions]

1. What plan do we follow in teaching?
Four-step plan
2. What are the four steps of the four-step plan?
Step I, Preparation
Step II, Presentation
Step III, Application or Tryout Performance
Step IV, Test or Follow-up
3. What do we do to get ready to instruct?
We determine what is to be taught and the amount of time for each lesson. We refer to this as a timetable or schedule.
4. What is one key to successful teaching?
The ability to simplify a complex subject is one key.
5. Why are some jobs unteachable in their natural forms?
They are too long and too involved.
6. What is an operation?
An operation is one part of a job. Jobs are made of operations or steps.

7. What is done to the operation or job to make it simple and easy to understand?

The operation or job is broken down into steps and key points.

8. What is a step?

It is significant action which advances a job or operation toward completion.

9. What are key points?

Key points are information needed in order to perform the steps, the "why's" of each step, the instructions given a learner so he can perform a step correctly.

10. How is safety listed on a job breakdown sheet?

Safety is listed as a key point.

11. Where is a completed job breakdown sheet used?

In Step II, Presentation, of a manipulative skill lesson plan

12. Why is it necessary to have all equipment, materials, and supplies ready for teaching?

To be sure they are available and in working order to conduct a complete lesson

13. What are the consequences if equipment is not ready?

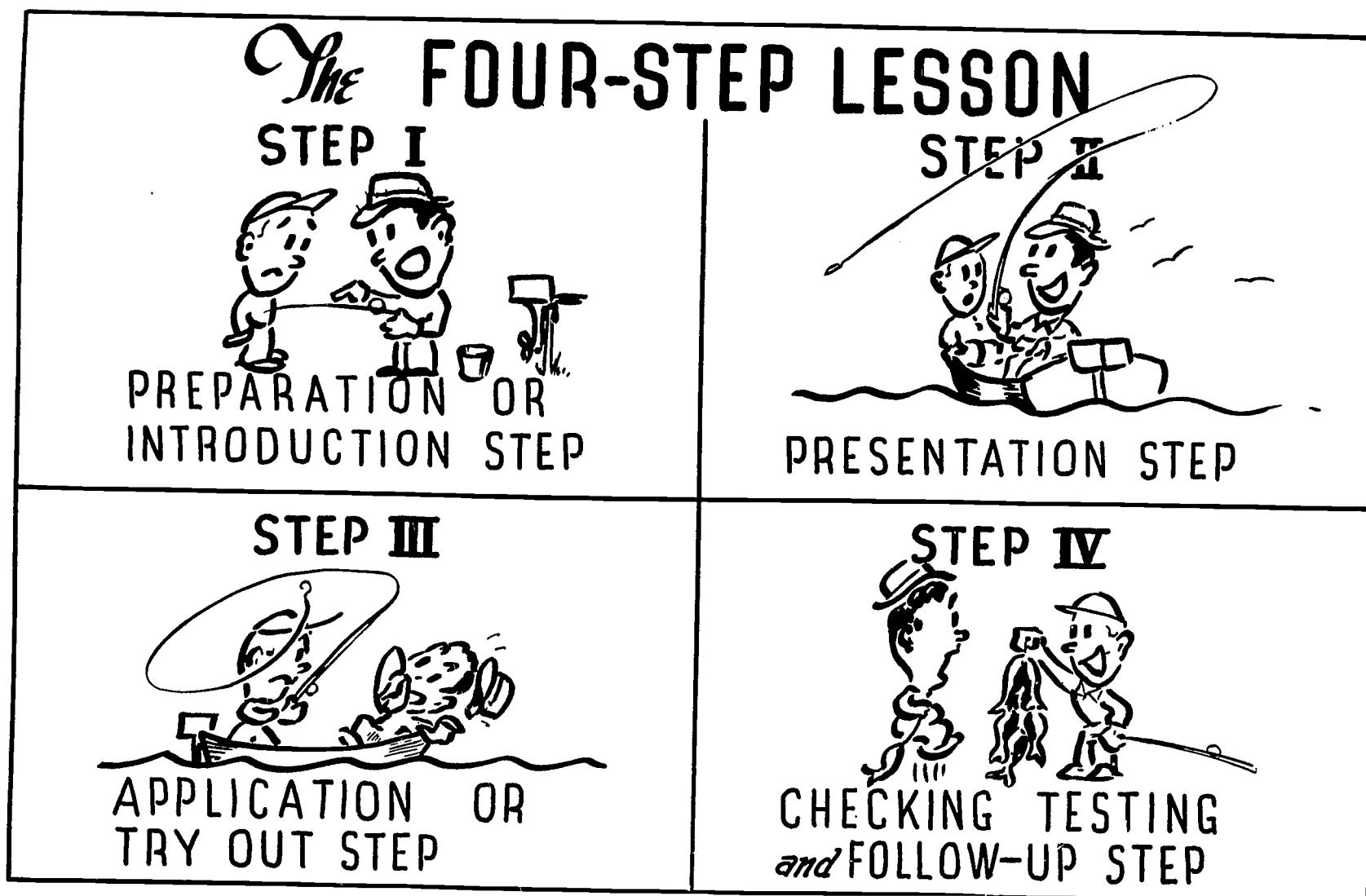
It destroys preparation, disrupts session, and causes loss of time and discipline problems.

[Provide time in the application step for trainees to work on their job breakdown sheets and lesson plans. Work with them, answer questions, give assistance and encouragement.]

[Make a schedule for practice teaching demonstrations. The first four demonstrations should be on manipulative skills, because the special lesson teaching related information has not yet been conducted.]

IV. TEST

Your test will be the satisfactory completion of the lesson for your practice teaching demonstration.



The four-step plan is used for both individual and group instruction.

HOW TO GET READY TO INSTRUCT

Have a Timetable
Include how much skill you expect him to have and by what date.

Break Down the Job
List important steps.
Pick out key points. (Safety is always a key point.)

Have Everything Ready
Have the right equipment, materials, and supplies.

Have the Workplace Properly Arranged
Arrange workplace just as the worker will be expected to keep it.

Name of
Sponsoring School
Here

Keep This Card Handy

HOW TO INSTRUCT

Step I: Prepare the Worker
Put him at ease.
State the job and find out what he already knows about it.
Get him interested in learning job.
Place in correct position.

Step II: Present the Operation
Demonstrate and explain one IMPORTANT STEP at a time.
Stress each KEY POINT.
Instruct clearly, completely, and patiently, but no more than he can master.

Step III: Application or Try-Out Performance
Have him do the job--correct errors.
Have him explain each KEY POINT to you as he does the job again.
Make sure he understands.
Continue until YOU know HE knows.

Step IV: Follow Up or Test
Test to determine if he has learned the skill or information.
Put him on his own. Designate to whom he goes for help.
Check frequently. Encourage questions.
Taper off extra coaching and close follow-up.

**If Worker Hasn't Learned.
The Instructor Hasn't Taught**

This illustration is the front and back of a reminder card used by many successful vocational instructors. It tells how to use the four steps when teaching a skill.

JOB BREAKDOWN SHEET

JOB SIGN-WRITER'S CUP OPERATION _____

IMPORTANT STEPS IN THE OPERATION

Step: A significant action which advances the job or operation toward completion.

(WHAT DOES THE WORKER DO?)

Key Point: The KEY to doing the job correctly, safely, efficiently or accurately

(WHAT MUST THE WORKER KNOW TO DO THE JOB?)

1. Make crosswise creases.

1. Roll into cylinder, matching ends.
2. Card divided into three equal parts
3. Do not crease with fingernails.

2. Make lengthwise creases.

1. Hollow sides of creases on same side

3. Fold the diagonal creases at corners.

1. One corner at a time
2. Match corner creases.
3. Corner folds away
4. Diagonal crease starts at point where corner creases join.

4. Fold the ends of the cup.

1. Around end of cup, not sides

5. Fold the flaps down.

1. Flaps bend out in line with top of cup.

THIS JOB BREAKDOWN WAS MADE BY _____ DATE _____

STEPS AND KEY POINTS

A step is a significant action which advances the job or operation toward completion.

For example:

In the job breakdown on the sign-writer's cup, "roll into cylinder, matching ends" is NOT a step.

The step is "1. Make a crosswise crease," and "roll into cylinder, matching ends" is just a key point that makes the step produce accurate results.

Job breakdowns do NOT go into hair-splitting details. They are SIMPLE, COMMON SENSE analyses of the important steps in "putting over" a job.

"Key point" is the term for the "key" to the "right doing" of a step. Key points cover (in order of their importance):

1. Factors that "make or break" the job.
2. Hazards (in many jobs these rank first).
3. Pointers that make the job easier to do--"knack," "trick," "feel," "savvy," "special timing," "bit of special information."

Key points do not cover every conceivable detail that should be watched or that might go wrong.

Knowing what key points are and how to pick them out quickly are perhaps the most important things in job instruction.

Examples of Key Points:

FEEL--When putting a micrometer on a piece of stock, the key point is "how tight"--a matter of feel.

KNACK--When riveting, it is important to know when to remove the pneumatic riveter. The key point here is to listen to the riveting. The sound will change when the pieces are solidly together.

TIMING AND PLACING OF HEAT--When welding, there are among others two key points: (1) apply the flame ahead of the weld, and (2) get the metal to the right temperature by observing the color and behavior of the metal.

HAZARD--When using a knife, a key point is to "cut away from you." When lifting a load with an overhead crane, a key point is to pull the chains or cables up taut, then hesitate for a moment to check the hitches before lifting the load.

SPECIAL MOTION--When catching hot rods rushing out of rolling mills, the key point is to swing the flowing rod in an arc away from you quickly before inserting the end in the next set of rolls.

JOB SHEET
in
TEACHER TRAINING

NAME OF JOB: Practice demonstration teaching

MATERIALS: Copies of Instructor's Lesson Plan sheets
Copies of Job Breakdown Sheet
 Pencil or pen for writing in the lesson

GENERAL INSTRUCTIONS:

1. Prepare to teach a four-step demonstration lesson to the entire group or to one or two class members within the group.
2. Be ready to teach your lesson at the time assigned by the teacher trainer.
3. The timetable or schedule for your lesson is 20 minutes.
4. Keep demonstration practice lesson short and simple but complete.

GET READY TO TEACH:

<u>Steps</u>	<u>Key Points</u>
1. Select a job, operation, or subject.	a. Choose from your occupation or from the list below. b. Write name on <u>Instructor's Lesson Plan</u> sheet.
2. Determine the aim or purpose of this lesson.	Write on the lesson plan what you expect class members to accomplish.
3. List equipment, tools, materials, and supplies needed. Include those to be used by instructor and learners.	Fill in this information on the plan sheet.
4. List teaching aids required.	Include anything that will help explain the job.
5. Make notes on Step II, Presentation.	a. Use the <u>Job Breakdown Sheet</u> for listing steps and key points.

6. Make notes on Step III, Application.

Copy on lesson plan.

b. Plan to use explanation.

a. Indicate that learner will perform the skill while you watch.

b. Plan to allot time for learner to practice.

c. Plan questions to check understanding.

7. Make notes on Step IV, Test.

Plan a performance test or another way to determine if learner has acquired desired level of skill. For an information lesson, prepare a test.

8. Make notes on Step I, Preparation.

Write how you will convince learner of need to acquire skill or master information in lesson.

DO PRACTICE TEACHING:

1. Make required room arrangements.

a. Arrange furniture to suit your needs.

b. Write subject and aim on the chalkboard.

c. Write your name on the chalkboard.

d. Indicate whether you are teaching an individual or the whole group.

2. Put on the training.

a. Follow lesson plan.

b. Use the four-step plan of instruction.

c. Use accepted methods and aids.

d. Close on time.

3. Put room back in order.

a. Rearrange furniture.

b. Clear front desk.

SUGGESTED SUBJECTS FOR PRACTICE TEACHING:

Manipulative Jobs

1. Lay Out Common Rafter With Steel Square
2. Lay Out Common Rafter by Step-Off Method
3. Test Generator Armature
4. Cut 2 x 4 Lengths With Crosscut Saw
5. Adjust Spark Plug Gap Clearance
6. Bore a No. 10 Hole in 1 x 4
7. Cut Round Bar Stock With Hacksaw
8. Cut Square Bar Stock With Hacksaw
9. Cut Thin-Walled Tubing With Hacksaw
10. Wire an Attachment Plug
11. Make a Tap Splice
12. Take a Patient's Temperature
13. Give an Ear Irrigation
14. Roll a Flat Curl

Technical Information

1. Diameter of Numbered-Size Electric Wire From Table
2. Properties of Three Mortar Formulas
3. Formula for Weights and Sizes of Nails
4. Names of Parts of a Brick
5. Types of Nails
6. Principle of Bourdon Tube
7. Use of Handbook To Secure Circumferences, Diameters, or Volume
8. Identify Abrasive Grinding Wheels
9. Parts of Auger Bit
10. The Bricklayer's Folding Rule
11. Kinds and Types of Cuts (Teeth) on Files
12. The Numbering System for Marking Radio and Electronic Tubes

Mathematics and Science

1. Calculate Piston Displacement in One-Cylinder Engine
2. Change °C Reading to °F Reading
3. Figure a Lumber Bill
4. Pressure Exerted by One Jaw in Four-Jaw Independent Lathe Chuck
5. Arithmetic of Changing T.P.I. to T.P.F.
6. Arithmetic To Determine T.P.F. or T.P.I.
7. Number of Feet in a Coil of Wire
8. The Use of Ohm's Law in Resistance Calculations
9. Finding Actual Pressure in an Engine Manifold
10. Calculating R.P.M. for Lathe Work

SAMPLE SHEET A
Reproduce locally;
4 or more per trainee.

JOB BREAKDOWN SHEET

JOB _____ OPERATION _____

IMPORTANT STEPS IN THE OPERATION

Step: A significant action which advances the job or operation toward completion.

(WHAT DOES THE WORKER DO?)

Key Points: The KEY to doing the job correctly, safely, efficiently, or accurately

(WHAT MUST THE WORKER KNOW TO DO THIS JOB?)

THIS JOB BREAKDOWN WAS MADE BY _____ DATE _____

Instructor's Lesson Plan

Manipulative Skills

Unit _____
Lesson _____

JOB (or operation):

AIM (or purpose):

TOOLS AND EQUIPMENT:

(NOTE: More space may be desired
between headings.)

MATERIALS:

TEACHING AIDS:

REFERENCES:

I. PREPARATION (of the learner)

II. PRESENTATION (of the skills):

Operations or Steps	Key Points (things to remember to do or say)

(CONTINUED)

(Additional blank sheets can be ruled into two columns for notes for presentation step.)

II. PRESENTATION, continued

Operation or Steps	Key Points (things to remember to do or say)

III. APPLICATION (practice by learner under close supervision)

IV. TEST (performance of skill to acceptable standards)

Instructor's Lesson Plan

Related Technical Information

Unit _____
Lesson _____

SUBJECT:

AIM (or purpose):

TEACHING AIDS:

MATERIALS:

REFERENCES:

I. PREPARATION (of the learner)

II. PRESENTATION (of the information)

Instructional Topics	Things to Remember to Do or Say
	(CONTINUED)

(Additional blank sheets can be ruled into two columns for notes for presentation step.)

II. PRESENTATION, continued

Instructional Topics	Things to Remember to Do or Say

III. APPLICATION (drills, illustrations, analogies, oral questions or assignments)

IV. TEST (final check on students' comprehension of material presented)

Suggested Reading for Student:

The Next Lesson Is:

SESSION TWO
Part 1 of 3
90 minutes

INSTRUCTOR'S GUIDE SHEET

Practice Teaching Demonstrations 1 and 2

AIM: To provide an opportunity for practice and to determine whether each trainee can apply the information being taught in a practice teaching demonstration.

SUGGESTIONS FOR PREPARING TO TEACH: This session is the application or tryout step of the four-step lesson plan. Two things are to be accomplished. While a trainee instructor gives his practice demonstration and actually teaches a lesson, the rest of the group will complete an evaluation sheet that will help them review all the steps and key points involved in a teaching job. It will be necessary to provide a Check Sheet for Practice Teaching to each trainee not presenting a demonstration lesson in this session. These can be reproduced locally, nine or more per trainee, following Sample Sheet D closely.

SUGGESTIONS FOR TEACHING:

1. While first trainee instructor is getting set up, pass out Check Sheet for Practice Teaching. Explain that it is to be completed after the lesson. Stress that for these demonstrations the only points to be evaluated are under "A. Get Ready" and "B. The Four Steps."
2. Get copy of job breakdown sheet and copy of lesson plan from trainee instructor.
3. Select one or more volunteers to be learners for the demonstration, as trainee instructor desires.
4. Have demonstration start. Observe whether trainee instructor follows his lesson plan. Complete checklist.
5. When time is up, stop demonstration.
6. Lead question-and-answer session on what the trainee instructor did or did not do to carry out the lesson effectively. Use lesson

plan and your checklist as guides to questioning. This questioning is important because it sets the stage for the next lesson.

7. Collect checklists from trainees and give to trainee instructor.
8. Repeat procedure in 1 through 7 above for second teaching demonstration.

CHECK SHEET FOR PRACTICE TEACHING

Name of JOB or
Name of LESSON _____

AIM _____

TRINEE INSTRUCTOR _____

Points To Check	Yes	No	Remarks
A. GET READY POINTS			
<ol style="list-style-type: none"> 1. Did he appear to have everything planned? Did he know what he was doing? 2. Were tools, equipment, and materials all in readiness (no fumbles)? Did he forget anything? 3. Was his desk or workplace in order? 4. Did he have a lesson plan? 			
B. THE FOUR STEPS			
STEP I, PREPARATION			
<ol style="list-style-type: none"> 1. Was the learner or group put at ease? 2. Did instructor find out what learner or group knew about the lesson at hand? 3. Did he tell learner or group enough about the lesson to make it genuinely interesting, yet keep the explanation brief? 4. Did he place the learner or group in proper position for correct instruction? 			

Points To Check	Yes	No	Remarks
STEP II, PRESENTATION			
1. Did he demonstrate and explain one important step at a time? Could you follow the steps?			
2. Were the key points really stressed? Could you catch them?			
3. Did he instruct clearly, completely, and patiently?			
STEP III, APPLICATION			
1. Did he have learner do the job?			
2. Did he correct errors?			
3. Did he provide enough time for practice?			
4. Did he have learner explain each key point as the learner did the job again?			
5. Did he really make sure the job or the information was learned?			
STEP IV, TEST			
1. Did the test cover what has been taught in the lesson?			
2. On completion, could the learners do the job unaided? Did the learners possess the essential knowledge?			
3. Were checks made of their performance or did he indicate such checks would be made?			

Points To Check	Yes	No	Remarks
C. ORAL QUESTIONS			
1. Did he use questions to motivate learners?			
2. Did he find out what learners already knew?			
3. Did he encourage active participation by use of questions?			
4. Did he spot-check instruction with questions?			
5. Did he use questioning to clarify points learners had not understood?			
6. Did he use questioning to stress important points?			
7. Did questions help hold the attention of the learner or learners?			
8. Were questions used to review material?			
9. Were questions brief and easily understood?			
10. Did questions require thought?			
11. Was each question limited to one main thought?			
12. Did each question have a specific purpose related to the subject under discussion?			
13. Did the instructor ask the question, then name a person to answer it?			

Points To Check	Yes	No	Remarks
D. SIX RECOMMENDATIONS			
<p>Did the instructor:</p> <ol style="list-style-type: none"> <li data-bbox="406 524 1161 612">1. Have a long-range goal, in addition to the immediate aims? <li data-bbox="406 671 1098 759">2. Teach from the known to the unknown? <li data-bbox="406 818 1119 865">3. Tie knowledge and skill together? <li data-bbox="406 924 1119 1012">4. Proceed from simple to complex, from easy to difficult? <li data-bbox="406 1071 804 1112">5. Reward success? <li data-bbox="406 1159 1035 1201">6. Provide for practice or drill? 			
E. RELATED INFORMATION LESSONS			
<ol style="list-style-type: none"> <li data-bbox="406 1377 1119 1466">1. Did the instructor explain why the information should be learned? <li data-bbox="406 1524 1098 1613">2. Did he make use of audio-visual aids when they were needed? <li data-bbox="406 1672 1098 1819">3. Were actual trade situations the basis for explanations of how the information could be used? <li data-bbox="406 1878 1119 2025">4. In Step III, were learners required to carry out an assignment related to the trade? <li data-bbox="406 2072 1161 2160">5. Was a written test prepared for use in Step IV? 			

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Oral questions

AIM: To teach the new instructor how to use oral questioning to make teaching more effective.

MATERIALS: Handout Sheet 6. Paper for short written test.

I. PREPARATION of learner

The four-step plan provides a foundation that is necessary for effective teaching. That foundation can be used to teach both skills and information--how to do a job and what must be known to do the job. But your chances of doing a competent teaching job will increase if you also make use of additional knowledge gained from the experience of other vocational teachers. This lesson will be the first of several that will provide additional information needed for effective teaching.

II. PRESENTATION of information

A. Uses of oral questioning

- 1. To MOTIVATE learner**
- 2. To FIND OUT what learner knows**
- 3. To ENCOURAGE PARTICIPATION of a learner**
- 4. To SPOT-CHECK EFFECTIVENESS of instruction**
- 5. To CLARIFY a point**

6. To STRESS a point
7. To keep ATTENTION
8. To REVIEW material

B. How to make questions effective

Four rules that help ensure effective questions are:

1. A question should REQUIRE THOUGHT. Although some questions may simply ask the respondent to repeat from memory, it is more effective to provide questions that require the application or use of the information being taught. This is why problem questions may be particularly good.
2. A question should be BRIEF AND EASILY UNDERSTOOD. It may be necessary to rephrase a question.
3. A question should be limited to ONE MAIN THOUGHT.
4. A question should have a SPECIFIC PURPOSE, related to the subject at hand.

C. Procedure for questioning

1. First, ask the question. Pause to give everyone a chance to think. Then select a person to answer. Select the respondent at random; otherwise, some learners will not pay attention until they think it is their turn.
2. Questions should be answered by trainees only if their names have been called. No concerted answers should be permitted.
3. A conversational, informal approach is recommended.

[Distribute Handout Sheet 6; explain it covers all points in this lesson.]

III. APPLICATION of information [Oral Questions]

[Explain that trainees will have a chance to apply their information on questioning in two ways: first, by answering questions on the subject; second, by using oral questioning in their lessons. After this, every demonstration will be evaluated on how well questioning is used.]

1. What can questions accomplish in Step I of a four-step lesson?
Motivate learners and find out what they already know.
2. List four ways that questions might help make Step II more effective.
Spot-check effectiveness of instruction, clarify a point, stress important points, and keep or reclaim attention.
3. What are the five ways questions can help in the application step of a four-step lesson?
Encourage participation, spot-check effectiveness, clarify a point, stress important points, and review material originally presented another way.
4. What is likely to be wrong with a question that can be answered "yes" or "no"?
It may not require thought. The learner has a 50-50 chance of being right, regardless of what he answers. The learner should not be able to answer unless he knows the answer.
5. List rules that will help in judging whether a question is satisfactory.
It should require thought; problem questions are particularly good. A question should be brief and easily understood. It should have one main thought. It should have a specific purpose that is directly related to the subject being taught.
6. Why does the instructor state a question before he names the person who will answer it?
The entire group will listen to the question and think about the answer.

IV. TEST [Written]

1. List the series of steps in asking a question.
Ask group, pause, select respondent.
2. List five uses for oral questioning.
It is used for motivation, getting participation, finding out what individuals already know, spot-checking effectiveness of instruction, clarifying a point, stressing a point, review, and holding attention.

3. List the four rules for judging a well-worded question.

It must require thought, be brief and easily understood, have one main thought, and have a specific purpose related to the lesson.

ORAL QUESTIONING

To become a successful instructor, you must master the art of questioning. Questions such as these . . .

WHY do we do it?

WHAT is its purpose?

WHERE should it be done?

WHEN should it be done?

WHO should do it?

HOW should it be done?

WHICH is better?

. . . are among the occupational teacher's most effective tools. He should learn to use them and keep them sharp.

QUESTIONS HELP THE INSTRUCTOR:

1. Motivate the group.
2. Find out what learners already know.
3. Encourage active participation by learners.
4. Spot-check effectiveness of the instruction.
5. Clarify a point that a student has not understood.
6. Stress important points.
7. Keep attention of the group and reclaim attention of the person whose mind has wandered.
8. Review material originally presented in another way, for variety.

TO BE EFFECTIVE, QUESTIONS:

1. Should be worded so that learner cannot answer unless he really knows. All questions should require thought. This rules out most questions which can be answered "yes" or "no." Problem questions are particularly effective.
2. Should be brief and easily understood. If it is apparent that learner does not understand a question, rephrase it immediately in words which will be understood.
3. Should be limited to one main thought. Avoid asking several questions in one breath or linking questions together with "and."
4. Must have a specific purpose that is related directly to the subject being discussed.

WHEN ASKING QUESTION, first state the question to the entire group. This procedure gets everyone thinking. Then pause for a moment to give them time to think. Finally, call the name of one trainee for the answer. (If he had been called by name before the question was asked, others might not have listened.) Do not use a routine for selecting the person to answer.

SESSION TWO
Part 3 of 3
60 minutes

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Teaching related information

AIM: To teach the learner how to use the basic four-step lesson plan when teaching related information.

MATERIALS: Handout Sheet 7. See list on Handout Sheet 7.

I. PREPARATION of learner

Much of the success of any worker depends on his knowledge and understanding of the information related to his trade. Practical skill is not enough. He may need to choose proper materials, to lay out and plan work, or to choose which of several methods is best for a particular job. He may need to master a great deal of what is commonly known as "trade theory" and be able to use that knowledge on the job. For that reason, the occupational instructor often must teach "related technical information" of the trade, or the information required for a particular job. The four-step plan is used for this instruction with certain key points especially important if the instructor is to succeed.

II. PRESENTATION of information

A. Skill compared to related information lessons

1. In a skill lesson the instructor usually demonstrates the job. He actually does the job, explaining each step and key point as he performs it. The learner sees what is done, hears the explanation, and does the job himself under careful and gradually relaxed supervision. The follow-up step may not come until later when he is doing the work as an employee.

2. A related information lesson does not teach the skill required for doing the job. It provides information needed to understand what is done and how to do it correctly.

B. Special considerations for giving a related information lesson

When the four-step plan is used for a related information lesson, these key points should be kept in mind:

1. In Step I, Preparation, more effort may be required to make the learner realize why he needs the information.
2. In Step II, Presentation, the instructor will most likely use a short, illustrated talk. Some instructors recommend a 25-minute maximum, and many lessons are considerably shorter.
3. Every possible audio-visual aid--chalkboard, posters, or drawings--should be used.
4. Typical trade situations should be used when explaining the application of the information.
5. A short question-and-answer period after presenting the information will help learners learn.
6. In Step III, Application, learners should carry out an assignment involving actual occupational problems. Problems they solve should make use of drawings, layouts, sketches, and calculations taken directly from the trade. Work on the problems is done mostly in class, with the instructor giving individual help as needed.
7. The greater part of the time in the lesson should be devoted to Step III, and several periods of application may be required to give enough practice.
8. In Step IV, Test, the instructor should examine the work of learners and point out errors. A summary of common errors may be given to the group, with corrections suggested. In some cases a short written test should be given. When a test is used, do not assist learners in completing it.

C. Demonstration lesson by teacher trainer

[Demonstrate a short, related information lesson. Use Handout Sheet 7 as the lesson plan and pass out copies of it so trainees can follow your procedure.]

D. Summary of what was done by instructor in demonstration lesson

1. In Step I instructor explained why this particular information was valuable to the learner.
2. Step II included four instructional topics. Instructor had notes in lesson plan on what to teach about each topic.
3. A visual aid was used to make clear the characteristics of each line and its purpose. [Stress that often visual aids also are vital for skill lessons.]
4. In Step III learners drew the four lines themselves.
5. For Step IV a set of questions was prepared for use in a written, unassisted test.

III. APPLICATION of information

[Explain that the application of this information will be made by trainee instructors who plan to give related information lessons for practice teaching demonstrations. The check sheet includes points for evaluating a related information lesson.]

IV. TEST

[Explain that the test of understanding this information will come when trainee instructors are evaluated after their demonstration lessons.]

Instructor's Lesson Plan

Related Technical Information

Unit _____
Lesson _____

SUBJECT: Alphabet of Lines

AIM (or purpose): To bring about an understanding of the meaning of the basic lines in a drawing or blueprint.

TEACHING AIDS: Chart showing lines with brief explanation identifying each type of line; chart with drawings fully dimensioned.

MATERIALS: Paper, 8" x 11", drawing board, pencil (2H), T-square, 45-degree triangle or other straightedge, paper for test.

REFERENCES: Spencer, Basic Technical Drawing, page 20. The Macmillan Company, New York, 1962.

I. PREPARATION of learner

In drawing and blueprint reading, it is necessary to recognize and understand the various lines used to construct, measure, and show the design of a machine part or structure.

II. PRESENTATION of information

Instructional Topics	Things To Remember To Do or Say
A. Object line	<ol style="list-style-type: none"> 1. Is a heavy solid line 2. Represents the real object on a drawing or blueprint 3. May be shown from several views or angles
B. Extension line	<ol style="list-style-type: none"> 1. Is a thin solid line 2. Extends from object to indicate points of measurement 3. Seldom touches object ($\frac{1}{16}$" from object point of measure)

Instructional Topics	Things To Remember To Do or Say
C. Dimension line	<ol style="list-style-type: none"> 1. Is a light solid line 2. Is broken for indicated measure between points of measure 3. Has arrow on either end 4. Arrows touch extension lines, usually $\frac{1}{4}$" distance from end away from object.
D. Hidden line	<ol style="list-style-type: none"> 1. Is a heavy broken line 2. Represents hidden shapes of the object that are obstructed by the exposed view

III. APPLICATION (drills, illustrations, analogies, oral questions, or assignments)

1. Draw or sketch an object 3" long, 2" wide, 1" thick.
2. Add extension lines.
3. Add dimension lines, showing dimensions.
4. Show a step cut across the back of the object across the center length, using a hidden line.

IV. TEST (final check on students' comprehension of material presented)

[Write the questions on chalkboard. Have trainees write their answers on $8\frac{1}{2}$ " x 11" paper and hand in.]

1. What does the heavy solid line of a drawing or blueprint represent?
The visible surface or edges of the object
2. How do we indicate the points of measurement of an object?
With extension lines
3. What distance is used between the extension lines and the object?
Approximately $\frac{1}{16}$ "
4. With what line construction could you identify a dimension line?
A thin solid line
5. What does the dimension line indicate on a drawing or blueprint?
The actual measurement between the extension lines
6. How are hidden features of an object indicated on a drawing or blueprint?
With heavy broken lines called "hidden lines"

SPECIAL CONSIDERATIONS FOR GIVING A RELATED INFORMATION LESSON

When the four-step plan is used for a related information lesson, these teaching points should be kept in mind:

1. In Step I, Preparation, more effort may be required to make the trainee realize he needs the information.
2. In Step II, Presentation, the instructor will most likely use a short illustrated talk; some instructors recommend a 25-minute maximum, with many lessons considerably shorter.
3. Every possible audio-visual aid, such as chalkboard, posters, or drawings, should be used.
4. Typical trade situations should be used when explaining the application of the information.
5. A short question-and-answer period after telling and illustrating the information will help the trainees learn.
6. In Step III, Application, learners should carry out an assignment involving actual occupational problems or other use of the information taught. Work on problems is done mostly in class with instructor giving individual help as needed.
7. The greater part of the time in the lesson should be devoted to Step III, and several periods of application may be needed to give enough drill.
8. In Step IV, Test, the instructor should examine the work of the learners and point out any errors. A summary of common errors may be given to the class, with corrections suggested. In some cases a short test should be given. When a test is used, the instructor should not assist learners in completing it.

SESSION THREE
Part 1 of 3
30 minutes

INSTRUCTOR'S GUIDE SHEET

Practice Teaching Demonstration 3

AIMS: These are the same as those for all teaching demonstrations.

SUGGESTIONS FOR PREPARING TO TEACH: These are the same as those listed in the instructor's guide sheet for demonstrations 1 and 2, page 43.

SUGGESTIONS FOR TEACHING: Follow the same procedure that was used for demonstrations 1 and 2, as described on page 43, BUT add one new category when using the Check Sheet for Practice Teaching.

The categories that should be evaluated for this demonstration are:

- A. Get Ready Points
- B. The Four Steps
- C. Oral Questions

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Factors that affect learning

AIM: To teach some factors that influence the teaching-learning process and how they can be used in the four-step plan.

MATERIALS: Handout Sheets 8, 9, and 10. Paper for written test.

I. PREPARATION of the learner

Two basic responsibilities confront the person who is selected to teach adults. He must gain as complete an understanding as possible of the learning and teaching processes. He must understand some factors peculiar to the instruction of adults and be able to use those factors constructively in conducting his lessons and course.

II. PRESENTATION of information

A. What the learner brings with him--the senses

1. Every learner brings certain knowledge, attitudes, attributes, and abilities that can help or hinder the teaching-learning process.
2. Normally, everyone brings the five senses. [Distribute Handout Sheet 8.] These are sight, hearing, touch, smell, and taste. [Discuss The Senses Through Which We Learn, using Handout Sheet 8 as a guide.]
3. Depending on the occupation, some senses are more important than others. But the effectiveness of teaching can be increased by appealing to more than one sense at a time. We retain (learn

well enough to use later) approximately 10 percent of what we read, 20 percent of what we hear, and 30 percent of what we see. BUT WE REMEMBER APPROXIMATELY 50 PERCENT OF WHAT WE BOTH SEE AND HEAR. This is one reason why an instructor writes on the chalkboard or uses other visual aids. Another reason is that some things cannot be understood clearly unless they are seen.

4. Further, WE RETAIN APPROXIMATELY 70 PERCENT OF WHAT WE SAY AND 90 PERCENT OF WHAT WE DO AND SAY.
5. These estimates of results [point to statements on chalkboard] explain why an instructor will often FIRST SHOW AND TELL WHAT HE WANTS THE LEARNER TO MASTER, THEN GIVE THE LEARNER A CHANCE TO EXPLAIN THE JOB WHILE THE LEARNER DOES IT.

B. Individual differences

Differences between individual adults affect:

1. Their reasons for wanting to learn a lesson. Therefore, an argument that convinces one person of the importance of a lesson may not convince another.
2. The speed and thoroughness with which each one learns. For this reason it is important to make frequent checks during a lesson to see if individuals are learning, reteaching if necessary, using varied approaches to get the job done. Because people learn at different rates, it may be necessary to give additional attention to some individuals. A later lesson will tell how instruction can be individualized.
3. Adults differ in INTEREST, INTELLIGENCE, PAST EXPERIENCE, ABILITY TO CONCENTRATE, SENSE OF WELL BEING, ABILITY TO REMEMBER, IMAGINATION, and SELF-CONFIDENCE. [Distribute Handout Sheet 9.] This sheet discusses each factor in more detail.

C. Special consideration when teaching adults

The adult learner usually:

1. Has the ability to see relationships between what he knows and what he is studying. The varying degrees of experience, training, and

mature judgment usually evident in adult groups will provide an informed instructor with good beginning points for gaining greater receptivity of his material.

2. Tends to be an active learner, welcoming the chance to apply what he has learned. The wise instructor will plan each session with ample opportunity to apply what is taught.
3. Is serious in approaching an activity; is almost always seeking a specific goal.
4. Is less inclined to impulsive action; frequently requires time for thinking through processes and problems. Providing this time will result in rewarding developments in the learning process.

III. APPLICATION of information:

[Give each trainee a copy of Handout Sheet 10. Have the learners work individually on the assignment. Circulate among them and give assistance in understanding instructions and matching factors to steps as needed. When they have finished assignments, compare and discuss results. Answers are:

Step I--2a, 3a, 4a, 4b, 4c

Step II--1a, 1b, 2b, 3b, 4a, 4d

Step III--2b, 2c, 3b, 4a, 4b, 4d

Step IV--3b, 2c, 4d

Explain that another opportunity to apply what they have learned comes in planning and giving individual lessons.]

IV. TEST

1. Why is it important to appeal to more than one of the senses in teaching? The chances of the learner's retaining what he has been taught are increased.

2. What are we most likely to remember?
Something which we both say and do

3. List four ways in which adults differ.
Interest, intelligence, experience, ability to concentrate, sense of well being, ability to remember, imagination, self-confidence

THE SENSES THROUGH WHICH WE LEARN

SIGHT--We acquire most of our knowledge through the sense of sight. Observation of action and the study of drawings, diagrams, models, and pictures are indispensable in trade training. (Merely reading printed words is considered as being more related to hearing than sight.)

HEARING--Through hearing we are able to learn from the experiences of others. It also enables us to receive instructions and to recognize the proper operation of tools, machines, and the like.

TOUCH--Through the sense of touch we become aware of the quality and texture of materials, degree of roughness and smoothness, heat and cold, and, to some degree, the shapes of objects.

SMELL--The sense of smell is important, to a limited extent, in several trades, chiefly in recognizing materials, chemicals, and the like.

TASTE--The sense of taste is perhaps the least used of all the senses, particularly in mechanical trades. Of course, it is important in trades in which foods and drugs are processed.

SOME TRAINING PRINCIPLES

If we are to consider how to train, it would be helpful first to understand something of how men learn.

We are told that we retain approximately:

- 10 percent of what we read
- 20 percent of what we hear
- 30 percent of what we see
- 50 percent of what we see and hear

The individual in these situations may be relatively passive; he is "receiving." These percentages are clearly only approximations, but they do indicate where emphasis in training should be placed. We shall be much more certain of this, however, if we can find some practical proof. What, for example, have we found out about learning in the vast laboratory of industrial training?

1. Men learn faster by seeing and hearing than by hearing alone.

2. Men learn still faster when doing is added to seeing and hearing. It is doing which makes learning permanent.
3. Men tend to remember more of what they did in training than what they were told in training.
4. Thus, men should be trained for positions under conditions that are as nearly like the actual job as possible.

SOME IMPORTANT FACTORS IN LEARNING IN WHICH INDIVIDUALS DIFFER

The good supervisor realizes that individuals differ in their mental capabilities as in their physical makeup and makes provisions for adapting his training techniques to best fit the learning abilities of each individual worker. Following are some factors which greatly influence a person's ability to learn and which the teacher must recognize in "individualizing" his instruction.

INTEREST--Without worker interest, instruction is more or less futile. A person learns well those things in which he has a vital, sustained interest. On the other hand, he rebels and ceases to learn when he is bored or fails to see a personal benefit in learning the lesson.

INTELLIGENCE--Briefly stated, intelligence is the ability to respond quickly and successfully to new or unusual situations. It enables the learner to "tie up" new ideas with his past experiences and knowledge. The so-called native intelligence of a person changes very little throughout his life and is not increased by education.

PAST EXPERIENCES--A person's background of experiences forms the basis for receiving additional knowledge.

CONCENTRATION--It is difficult for a person to fix his attention on one idea for very long. Yet he may refocus his attention quickly when his mind wanders. The ability to do this repeatedly over a period of time is known as "power of concentration."

MEMORY--A person's ability to remember is extremely important in learning. Factors which influence memory are vividness, uniqueness, frequency, and relative importance.

WELL-BEING--Mental and physical comfort increase one's power of concentration. On the other hand, pain, discomfort, and such emotions as grief, irritation, anger, and worry greatly hinder mental processes. The good training man tries to put his group at ease in a cheerful frame of mind before presenting the lesson.

SELF-CONFIDENCE--A person learns something better if he thinks he can. Fear of bodily injury, fear of failure or spoiling a job, and fear of criticism or humiliation make learning difficult, if not impossible. The good supervisor never purposely assigns a worker a task beyond his ability to perform,

nor says or does anything that would tend to make the learner lose confidence in himself.

IMAGINATION--Imagination is the power to form mental pictures of things not actually present. It helps the craftsman to visualize the finished job before he begins it. A man without imagination can never learn to read a blueprint.

ASSIGNMENT SHEET
in
Occupational Instruction

SUBJECT: Factors that affect learning

AIM: To gain an understanding of some factors that influence the teaching-learning process. To learn some facts about adults that will help in teaching them.

INTRODUCTORY INFORMATION: The material covered by this lesson is only a small portion of what is known about how people learn, yet provides a sound basis for training adults for an occupation. This assignment is intended to help you understand how this basic information has been used in designing the four-step plan of instruction and how you can apply it in training situations.

REFERENCE: Some Factors That Affect the Teaching Process on Handout Sheet 10A.

QUESTIONS and/or PROBLEMS: Some Factors That Affect the Teaching Process lists 11 factors or rules which can be applied by an instructor when planning and giving a lesson. Each of the factors is usable in one or more of the four steps of a lesson. The chart on Handout Sheet 10B has the four steps with key points that can make or break each step in the left column. The right column is divided into four spaces, one for each step. In the space opposite each step, list those factors discussed which might prove important or useful for that step.

First Example: In Step I, Preparation, an instructor can make use of factor 4a discussed on the Handout Sheet 10A, which says that adults can usually see relationships between what they know and what they are studying. Often a person's interest can be gained in the preparation step by comparing what he knows to what he is about to learn.

Second Example: Factor 2b, "Effect," states that the more certain a person is of success, the greater is his desire to learn. By demonstrating and carefully explaining an operation several times, the instructor increases the learner's confidence in his success. Such repetition of teaching is done in Step II, Presentation.

SOME FACTORS THAT AFFECT THE TEACHING PROCESS

TEACHING IS A PROCESS IN WHICH:

The teacher plans, presents, tests, and thereby helps learner to understand information or develop a skill.

The learner develops new knowledge, new qualities, and new abilities and is able to apply them to a trade situation.

Even though the learner will not learn unless he takes an active part, the instructor is primarily responsible for success. "If the learner hasn't learned, the instructor hasn't taught."

1. The good instructor makes the most effective possible use of the learner's senses.
 - a. Men learn faster by seeing and hearing than by hearing alone.
 - b. Men learn still faster when doing or saying is added to seeing and hearing. It is doing which makes learning permanent.
2. The good instructor designs his lesson and course to take advantage of the three principles of learning.
 - a. Readiness. You learn a thing when you feel a need for it. You must be interested. Conditions must be right.
 - b. Effect. You must get satisfaction out of learning. Satisfaction comes from the success you have in learning the job. The more certain you are of success, the greater the desire to learn.
 - c. Practice. You like to repeat those things you have learned to do well, so practice becomes a pleasure rather than drudgery. The more you do a thing, the better you are able to do it.
3. People differ in many ways, and these differences affect:
 - a. The reasons they have for wanting to learn something. An argument that convinces one person of the need for a lesson may not convince another.
 - b. The speed and thoroughness at which each person learns. A teaching approach that works with one person may not work with another. That is why it is important to make frequent checks to see if individuals are learning, reteaching as needed, using varied approaches to get the job done.
4. The instructor must remember that adults:
 - a. Usually can see relationships between what they know and what they are studying. If an instructor knows a learner's background, he may be able to discuss the lesson in terms the learner already understands.
 - b. Are usually active learners and need a chance to apply what they are learning.
 - c. Are serious, almost always seeking a specific goal.
 - d. Are less inclined to be impulsive and need time to think processes and problems through.

THE FOUR-STEP PLAN OF INSTRUCTION (With Teaching Points)	FACTORS THAT APPLY OR MIGHT BE USED TO MAKE TEACHING MOST EFFECTIVE
STEP I. PREPARATION OF THE LEARNER <ul style="list-style-type: none"> <li data-bbox="426 491 1110 535">a. Put the learner at ease. <li data-bbox="426 538 1110 582">b. Find out what he already knows. <li data-bbox="426 585 1110 629">c. Get him interested in learning. 	4a
STEP II. PRESENTATION <ul style="list-style-type: none"> <li data-bbox="426 772 1089 960">a. Tell, show, demonstrate, illustrate, and question in order to put over knowledge or operation. <li data-bbox="426 963 1089 1106">b. Instruct slowly, clearly, completely, and patiently one point at a time. <li data-bbox="426 1109 1054 1153">c. Check, question, and repeat. <li data-bbox="426 1156 1054 1241">d. Make sure the learner really learns. 	2b
STEP III. APPLICATION (PERFORMANCE TRYOUT) <ul style="list-style-type: none"> <li data-bbox="426 1417 1130 1502">a. Have learner perform the operation. <li data-bbox="426 1504 1130 1648">b. Ask questions beginning with "Why," "How," "Who," "When," "Where," or "What." <li data-bbox="426 1651 1110 1736">c. Observe performances, correct errors, repeat. <li data-bbox="426 1739 1054 1824">d. Make sure the learner really learns. 	
STEP IV. TEST (FOLLOW-UP) <ul style="list-style-type: none"> <li data-bbox="426 1955 1089 2070">a. Test to determine if he has learned. <li data-bbox="426 2073 870 2116">b. Put him on his own. <li data-bbox="426 2119 1110 2316">c. Check frequently and be sure he follows instructions. Taper off extra supervision and close follow-up until he is qualified to work with normal supervision. 	

SESSION THREE
Part 3 of 3
30 minutes

INSTRUCTOR'S GUIDE SHEET

Practice Teaching Demonstration 4

AIMS: These are the same as those for all teaching demonstrations.

SUGGESTIONS FOR PREPARING TO TEACH: These are the same as those listed in the instructor's guide sheet for demonstrations 1 and 2, page 43.

SUGGESTIONS FOR TEACHING: Follow the same procedure that was used for demonstrations 1 and 2, as described on page 43.

The following categories should be evaluated for this teaching demonstration:

- A. Get Ready Points
- B. The Four Steps
- C. Oral Questions

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Ways in which the instructor can help the learner

AIM: To acquaint the trainee instructor with six ways in which he can make learning easier and more effective.

MATERIALS: Handout Sheets 11, 12, and 13. Paper for written test.

I. PREPARATION of learner

This lesson covers six recommendations which are based either on the three principles of learning or on the observations and experiences of competent vocational educators. These recommendations properly used will help to make your teaching more effective and learning more likely.

II. PRESENTATION of information

Six recommendations for instructors:

1. HAVE A LONG-RANGE GOAL IN ADDITION TO THE IMMEDIATE AIMS. A long-range goal will help motivate learners throughout their training. Immediate aims are necessary to develop interest in specific lessons. Remind learners of both goals and aims.
2. TEACH FROM THE KNOWN TO THE UNKNOWN. The instructor must relate new materials to the past experience of the learners, making comparisons with situations and things familiar to the learners.
3. TIE KNOWLEDGE AND SKILL TOGETHER. When it is necessary to teach skills and the related information in separate lessons,

the instructor should explain in the preparation step how knowledge and skill are tied together and applied on the job.

4. PROCEED FROM SIMPLE TO COMPLEX, FROM EASY TO DIFFICULT. Complicated and difficult lessons should be broken down into simple parts that can be taught effectively. It is often effective to teach a series of simple ideas or steps separately before teaching the complex relationship between them.
5. PROVIDE FOR PRACTICE OR DRILL. This makes use of the principle of practice, and can best be done following certain recommendations. [Distribute Handout Sheet 11. Discuss it.]
6. REWARD SUCCESS. Complimenting a learner who shows improvement can motivate him to learn, while undue criticism can block the learning process. [Distribute Handout Sheet 12. Discuss it.]

III. APPLICATION of information

[Explain that the application step of this lesson will come primarily in the practice demonstrations or in the analyses they make on the checklists. Point out that it will probably be helpful for them to get a clearer understanding of why these recommendations are made, and that the assignment sheet will help them develop that understanding. Have them complete the assignment on Handout Sheet 13, assisting them when needed. Have group discussion on each of the six recommendations and the underlying reasons for them. Answers are: A-1, B-2, C-1, D-4, E-4.]

IV. TEST [Written]

1. Why compliment before correcting?
It makes trainee more receptive to receiving correction.
2. Why shouldn't a person be corrected in front of others?
It is embarrassing and demoralizing to person being corrected.
3. List the five recommendations for teaching.
Have a long-range goal in addition to immediate aims. Teach from known to unknown. Tie knowledge and skill together. Provide for practice or drill. Teach from simple to complex, from easy to difficult. Reward success.

PRACTICE ON THE JOB OR DRILL ON THE LESSON

Aim: To give information helpful in using practice or drill in your teaching.

HANDWORK
(Practice on the Job)

HEADWORK
(Drill on the Lesson)

The trainee learns by exercising a skill under your direction. It is learning by doing. Practice is at its best when students use real materials, real machines, and production methods.

The trainee learns by drill on essential and meaningful information.

WHEN to use practice or drill:

1. When the trainee is to learn a skill to the point of its becoming a habit
2. When you want the trainee to remember essential information
3. When there is no choice of method--practice or drill is the only possible way

HOW to use practice or drill:

1. Relate the new information or skill with old skills or experience.
2. Help trainees form correct habits by following these simple rules:
 - a. Get learners started doing the thing right.
 - b. See to it that they do it always in the same way.
 - c. Encourage them to think about it as they do it.
 - d. Have them do it over and over at regular and frequent intervals.
3. To get trainees ready, arouse their interest.
4. Show them clearly what they must do or know.
5. Make the practice or drill as nearly as possible like the work they will do.

COMPLIMENTING AND CORRECTING LEARNERS

A sincere compliment can help make learning more effective. Correction, on the other hand, can block progress if it is not done properly.

These suggestions will help the instructor handle both corrections and compliments.

1. Avoid criticism. Nobody likes to be criticized, and most men want to learn; therefore, avoid criticism in the sense of "bawling out" a man for having done something wrong. Instead, show him how he could have done it better.
2. Compliment before you correct. Always find something on which to compliment a man before you correct him. It will make him more receptive to your correction. Make sure the compliment is sincere.
3. Let the trainee correct himself. When the trainee is induced to correct himself, the factor of unpleasantness is almost entirely eliminated. First compliment, then ask the trainee if he can think of anything he could have done that would have made his performance better. If he can't think of anything, you will have to make a suggestion.
4. Don't overdo correcting. Good instructors exercise restraint when correcting. They know that if they correct every little thing a man doesn't do quite right, they'll make him nervous, damage his self-confidence, and instead of being a help, their corrections will be harmful and annoying.
5. Don't correct in front of others. This, the worst kind of criticism, is embarrassing and demoralizing.
6. Don't be to quick to blame the trainee. If he doesn't do something right, the fault may lie in your methods of teaching.
7. Encourage the trainee. Compliments are an essential part of teaching. They encourage learning. Use judgment and do not overdo compliments. They can be spaced to serve as a steady support for the trainee's morale. There should be a good basis for all compliments, but a man doesn't have to do a perfect job to deserve a compliment. Improvement or progress, even though slight, is a basis for a sincere compliment.
8. Be prompt with your compliments or corrections. Make them immediately following the trainee's performance. Don't do it an hour later or the next day. It is especially important to compliment a person at the end of the day--it sends him home with the feeling of success, makes him feel that you were of help, and that working with you is worthwhile.

ASSIGNMENT SHEET
in
Occupational Instruction

SUBJECT: What the instructor can do to help the learner

AIM: To learn six ways in which the instructor can make learning easier and/or more effective for the learner.

INTRODUCTORY INFORMATION: Each of the six recommendations covered in this lesson is based on actual observations about the learning process made by capable instructors in training situations. Even though you could just memorize the list, you will probably use them more often and more intelligently if you know why each recommendation aids learning. This assignment will help you develop that understanding.

QUESTIONS OR PROBLEMS: Provided below are two lists. The first list tells some observations that have been made about how people learn better. The second list includes the six recommendations this lesson covered that will help you teach better. In the blank space following each recommendation, place the number of the observation on learning which explains why that recommendation is important.

Some observations about learning:

1. We learn best when there is a need for learning. (Principle of Readiness)
2. We learn new things best in terms of old. (Principle of Readiness)
3. We learn best by doing. (Principle of Practice)
4. We learn best if we can expect and experience success. (Principle of Effect)
5. The more we do a thing, the better we are able to do it, and the more we enjoy doing it. (Principle of Practice)

Some recommendations for teaching:

- A. Have a long-range goal, in addition to the immediate aims. _____
- B. Teach from the known to the unknown. _____
- C. Tie knowledge and skill together. _____
- D. Proceed from simple to complex, easy to difficult. _____
- E. Reward success. _____
- F. Provide for practice or drill. _____

INSTRUCTOR'S GUIDE SHEET

Practice Teaching Demonstrations 5 and 6

AIMS: These are the same as those for all teaching demonstrations.

SUGGESTIONS FOR PREPARING TO TEACH: These are the same as those listed in the instructor's guide sheet for demonstrations 1 and 2, page 43.

SUGGESTIONS FOR TEACHING: Follow the same procedure that was used for demonstrations 1 and 2, as described on page 43.

The following categories should be evaluated for these teaching demonstrations:

- A. Get Ready Points
- B. The Four Steps
- C. Oral Questions
- D. Six Recommendations

If a related information lesson is taught, evaluate it also for:

- E. Related Information Lessons

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Group instruction compared to individual instruction

AIMS: To develop the ability of the trainee to decide whether a lesson or portion of a lesson should be presented to an entire group or to individuals, one at a time. To teach how to use several teaching aids especially designed for directing the activities of individual learners.

MATERIALS: Handout Sheets 14 through 19. Enough $8\frac{1}{2}$ " x 11" paper to enable each learner to prepare several job sheets, assignment sheets, or other work sheets. Paper for written test.

I. PREPARATION of learner

For several reasons, certain lessons may be presented more effectively or advantageously to the whole group at once. At other times, it may be preferable or necessary to instruct individuals. Knowing when to use group instruction and when to change to individual instruction is vital to the occupational instructor. Special teaching aids have been developed to assist the instructor when he is working with individuals.

II. PRESENTATION of information

A. When to use group instruction

GROUP INSTRUCTION can be used for information lessons or, if the group is small enough, for teaching skill lessons. These are the ADVANTAGES OF GROUP INSTRUCTION:

1. SAVES TIME. More persons are reached simultaneously, and ground is covered more quickly.

2. PROVIDES UNIFORM INSTRUCTION. All learners receive identical information.
3. DEVELOPS TEAM SPIRIT. Group will learn to work together.
4. MOTIVATES INDIVIDUALS. Adults with common aims bolster each other's determination to succeed.
5. DEVELOPS LEADERSHIP.
6. Is useful for teaching BASIC and elementary PRINCIPLES and is a good starter for teaching common elements.
7. LEARNERS MAY ASSIST by teaching other members of the group if the teacher has failed to put a point across.

B. When to use individual instruction

Because of differences between persons, there are times when it is advisable to teach them individually or to give them supervision while they learn independently. In Step III, Application, the practice or drill given may require individual teaching or supervision. ADVANTAGES OF INDIVIDUAL INSTRUCTION:

1. Makes teaching MORE THOROUGH, even though at times it is slower.
2. Instruction can be GEARED TO LEARNING SPEED.
3. Makes instruction EASIER because it deals with only one person.
4. Gives OPPORTUNITIES FOR REMEDIAL WORK; makes it easier to review, correct, and provide practice.
5. Makes it EASIER TO USE VARIED INSTRUCTIONAL TECHNIQUES that meet the needs of each person.

C. Combining the two

A common procedure is for the lesson plan to provide for both group and individual instruction, with Steps I and II involving the entire group, and learners working as individuals doing practice or drill in Step III.

D. Directed activity

Much of the instruction given to individuals is through directed activity. The trainee is put on his own but receives guidance from the instructor to make certain he learns correctly, especially when manipulative skills and jobs are involved. Directed activity is often called supervised study; it may require the learner to find information for himself from reference sources or may guide him in specific drill questions or problems as he works in Step III. [Distribute Handout Sheet 14.] This information sheet on directed activity summarizes the basic points about all such activity. [Read and discuss it.]

E. Assignment sheets

[Distribute Handout Sheet 15. Discuss it. Point out that it provides the suggested format for an assignment sheet.]

F. Information sheets

[Distribute Handout Sheet 16. Discuss it. Point out that it provides the suggested format for an information sheet.]

G. Job sheets

Trainees need to do jobs often enough to become proficient. Job sheets are used in Step III, Application, as complete guides to specific jobs. Before a trainee is given a job sheet, he should receive all necessary preliminary instruction. Job sheets are prepared by the instructor. [Distribute Handout Sheet 17. Discuss it. Point out format for a job sheet.]

H. Job plan sheet

A job plan sheet is prepared by a learner with the instructor's guidance after the learner has acquired enough ability to plan his own work.

[Distribute Handout Sheet 18. Discuss it. Point out format for a job plan sheet.]

I. Operation sheets

Many jobs involve operations which are common to other jobs. For example, in building a staircase sawing lumber is a frequently repeated operation. The same operation is used in other woodworking. Similarly, in toolmaking a common operation is hardening steel.

A job sheet assumes that the learner knows how to do each operation in the job. Because this is not always true, one or more operation sheets may be needed for use with a job sheet. The number of such sheets depends on the learner and the job. [Distribute Handout Sheet 19. Discuss it. Call attention to suggested format.]

J. Special notes on job and operation sheets

1. By using job and operation sheets, the instructor can help make certain that a learner practices each job correctly.
2. Such sheets do not replace either initial instruction or the need for the instructor to provide personal supervision during the application step.
3. As a learner progresses, he will have less need for consulting job and operation sheets.
4. Job and operation sheets can be used repeatedly by many trainees if the sheets are properly identified and protected.
5. Some means should be provided for making such sheets easy to read by a trainee using both hands on a job. A rack at the machine or bench is useful for this purpose.

III. APPLICATION of information

1. [Have each learner prepare a job sheet for a job in the occupation he will teach. Ask which steps in the job might require an operation sheet. Have each prepare one operation sheet for use with the job sheet, if required. Observe and assist as needed.]
2. [Have each learner prepare either an assignment sheet, an information sheet or both, if required in the subject selected. Observe and assist as needed.]
3. [Have learners study the lesson plans for their demonstration lessons to determine whether it would be helpful to include a job sheet, one or more operation sheets, an assignment sheet, or an information sheet. Observe and assist as needed.]

IV. TEST [Written]

1. List three advantages of group instruction.
Saves time. Enables uniform instruction. Promotes team spirit. Motivates individuals who have common goals. Is useful for presenting basic principles.
2. List three advantages of individual instruction.
Probably more thorough. Geared to learning speed of individual. Easier because it deals with only one person. Good for remedial work. Instructional techniques may be varied to fit individual.
3. How are the two types of instruction often combined?
Entire group is taught during Step I, Preparation, and Step II, Presentation. Individual instruction is provided in Step III, Application.
4. List four teaching aids used in directed activity and tell the purpose of each.
Assignment sheets guide a trainee working with references to learn or apply information by himself. Information sheets provide additional information not easily available in references. Job sheets guide trainees when practicing jobs to become proficient. Operation sheets guide trainees when practicing operations to become proficient. Job plan sheets are prepared by a trainee so he can learn to plan jobs.

TEACHING METHODS

DIRECTED ACTIVITY

Everyone knows "we learn to do by doing." But merely doing things without the direction and guidance of an experienced person and without a definite purpose in mind has little educational value. Student activities may be guided and directed through use of written lesson assignments, job sheets, workbooks, projects, experiments, supervised drill or practice, and the like.



USE IT

- to supplement other methods of instruction.
- to save time in teaching.
- to boost the slow student.
- to enrich the instruction of the advanced student.
- to create and maintain student interest.

DON'T USE IT

- without your personal supervision.
- as a substitute for other methods of teaching.

DIRECTED ACTIVITIES CAN BE IMPROVED BY

- clear and adequate directions or procedures.
- adequate references if needed.

REMEMBER

- that no teaching aids--however good--can take the place of the teacher.
- that the most effective means of adjusting instruction to meet the needs of a group of students whose interest, background, and abilities differ is through individual lesson assignments.
- that any class which does not provide for student activity tends to become boring.

THE ASSIGNMENT SHEET

Assignment sheets can be used to:

1. Present new related information by having the learner study it in references.
2. Help learner apply information that he is learning. Such sheets provide the element of repetition so essential in the development of judgment and the ability to use information. In general, assignment sheets are most effective when they are used soon after presentation of information.

Examples of assignments in several representative occupations are:

Auto mechanics: Take specific gravity and voltage readings of several storage batteries and describe the condition of each from the data obtained.

Electrical installation: Solve the assigned problems by means of Ohm's Law.

Commercial art: Collect several samples of printing that illustrate the difference between the optical and the geometrical center of the page.

Foundry work: Calculate the estimated weights of the iron castings which are to be made from the accompanying drawings.

Printing: Figure the cost of the stock for the jobs described.

Dressmaking: Examine the samples of textiles furnished and fill out the data requested in the space provided.

Assignment sheets may involve:

1. New concepts to be learned
2. A series of questions to be answered
3. An experiment to be performed
4. Some problems to work out
5. Bills of material to make up
6. Drawings to analyze
7. Data to study and interpret
8. Procedures to plan
9. An observation or investigation to be made and data to be recorded

An assignment sheet should provide examples or other guidance to help the learner succeed. For example, if there are several problems, at least one of them should be solved with the correct approach clearly shown.

The purpose of an assignment sheet is to get a learner to do something. For that reason it is important for such a sheet to motivate the learner, convincing him that he will benefit by completing the assignment.

ASSIGNMENT SHEET

School _____

Assignment Sheet No. _____

Use same No. as in course of study.

Insert title of assignment

INTRODUCTORY INFORMATION: Short, concise statement to motivate the trainee to complete the assignment.

ASSIGNED READINGS: Listing of all printed matter and other resources to be used by the trainee in completing the assignment.

List the facts of publication: author, title, publisher, date, and page numbers covering assignments.

QUESTIONS, PROBLEMS, or ACTIVITY: The assignment should adequately cover the specific subject in this assignment sheet.

Questions and problems should be stated clearly and concisely.

The trainee should clearly understand what he is to do.

THE INFORMATION SHEET

Information sheets are intended to supply information which is not available to the learner in any other suitable form. Some representative information sheets from various occupations are:

<u>Occupation</u>	<u>Information</u>
Auto mechanics	The principle of the differential in an automobile
Electrical	The principle of the transformer
Plumbing	Cast iron pipe--types, sizes, and uses
Printing	The point system of measurement
Commercial food preparation	The action of yeast in bread dough
Cosmetology	The purpose and use of astringents
Dressmaking	Linen--what it is and where to use it

Because information sheets are to be studied rather than used to direct activity of a trainee, their format is not as formal as that of assignment sheets. An information sheet should be easy to read, clear, and concise. It should also be interesting to read and hold the trainee's attention.

An instructor may prepare and use an information sheet if any of the following conditions exists:

1. The information is in a reference book of which he has only one copy.
2. Up-to-date information is not included in the references used in the course.
3. Information in the reference does not cover the subject completely.
4. Material in a reference is too long.
5. Material in a reference is too difficult to understand.
6. Material from several sources should be consolidated in one place.

INFORMATION SHEET

School _____

Information Sheet No. _____

Use same No. as in course of study.

Insert title of information to be presented

INFORMATION:

- Written to suit level of trainee.*
- Sentences and paragraphs should be concise.*
- Illustrations should be used where they will assist in clarifying the information.*
- Material should be organized and presented in a logical sequence.*
- Material should be of sufficient length and complexity to challenge the trainee.*

THE JOB SHEET

In vocational education, learners are usually assigned actual jobs to perform under varying degrees of supervision. To help ensure success and high standards, the instructor prepares a job sheet for each such job. Job sheets are particularly useful in classes where different levels of instruction are being given at the same time.

Some typical jobs for which a learner would need a job sheet are:

<u>Occupation</u>	<u>Job</u>
Auto mechanics	Reline and adjust the brakes on a car.
Electrical	Install an extra convenience outlet.
Commercial food preparation	Make an order of cupcakes.
Plumbing	Run in a roof vent.
Printing	Print a wedding invitation.
Machine shop	Make a flanged bushing.
Sheetmetal	Make a section of sheetmetal cornices.
Cosmetology	Make a pin curl.

As used in the occupation itself, a job sheet may be quite simple, containing a blueprint or sketch and providing only the minimum information needed for the job. In a sense, the tickets, shop blueprint, work orders, and similar items used in an occupation are job sheets.

However, the learner in his early training needs more information than the experienced worker. For that reason the job sheets used in training are designed to help the trainee learn how to do the job, as well as to serve as a job assignment. Job sheets used for instructional purposes usually contain:

1. A statement of the job to be done.
2. A list of materials and equipment needed.
3. A procedure outline.
4. Directions for checking the finished work.
5. Pictures, diagrams, working drawings, and sketches to show what is wanted.
6. Pictures, diagrams, and sketches to clarify any anticipated difficulties the learner may have.

Gradually, the job sheets given a learner should become more like the job ticket, work order, or blueprints he will use in the occupation.

Some job form or job sheet should be prepared for each job that will be taught in a course.

JOB SHEET

School _____

Job No. _____

Use same No. as in course of study.

Insert name of job

SKETCH OR DRAWING: Provide drawing or make sketch if instructor deems necessary.

MATERIALS: List materials needed to perform job.

TOOLS AND EQUIPMENT: List tools and equipment needed to perform job.

PROCEDURE: State each operation or step in the job. Operations should be stated clearly and concisely.

List operations in proper sequence.

Number operations consecutively.

Safety and key points should be listed with the operations where they apply.

Double space between each operation.

CHECK POINT: A check point may occur at any operation in the procedure where the instructor desires to check the trainee before allowing him to proceed.

There may be more than one check point in the job.

Place the words CHECK POINT in the left margin at the point in the procedure where the trainee is to be checked by the instructor before the trainee is to proceed with the next operation.

THE JOB PLAN SHEET

As a trainee gains knowledge and skill in an occupation, the amount and kind of planning expected from him change. The job plan sheet is prepared by the trainee himself when he has enough ability to begin to plan his own work.

The amount of detailed planning shown on a job plan sheet should vary with the needs of the individual trainee. To begin with, he should be required to provide considerable detail. In time, a trainee's job plan sheet should become like the typical work order of the occupation.

This information is provided on the job plan sheet which a trainee prepares:

1. A bill of material listing the amount, kind, and size of material required
2. A list of operations in their proper sequence
3. A list of tools and equipment needed
4. An estimate of the time required to do the job
5. The necessary mathematical computations
6. The freehand sketches required
7. A list of the assignment sheets relating to the job

Advantages to be gained from using the job plan sheet are:

1. The learner gains experience in planning a job.
2. The learner knows the proper sequence of operations before he begins work.
3. The learner becomes acquainted with the necessary technology of the job.
4. The learner is required to solve practical problems for a job.
5. Both the learner and the instructor save shop time.
6. The job plan sheet serves as a record of work experience.
7. The job plan sheet provides a basis for later assignments.
8. Shop and related instruction can be coordinated more easily.

Suggested
Job Plan Sheet
Format

Trainee's Name _____

JOB PLAN SHEET

School _____

Job Plan No. _____

Use same No. as on progress chart.

Insert name of job

SKETCH OR DRAWING: If instructor deems necessary, trainee makes sketch or drawing as directed.

MATERIALS: List materials needed to perform job.

TOOLS AND EQUIPMENT: List tools and equipment needed to perform job.

PROCEDURE: State each operation or step in the job.

Operations should be stated clearly and concisely.

List operations in proper sequence.

Number operations consecutively.

Safety and key points should be listed with operations where they apply.

CHECK POINT: A check point may occur at any operation in the procedure where the instructor desires to check the trainee before allowing him to proceed.

There may be more than one check point in the job.

Instructor draws a red line in the left margin at the point in the procedure where the trainee is to be checked by the instructor before the student is to proceed with the next operation.

Estimated time _____ hrs.

(Determined by trainee, subject to instructor's approval)

Actual time _____ hrs.

(Actual hours to complete job)

Approved by instructor

(Initialed or signed before work is started)

THE OPERATION SHEET

An operation is one step in the process of doing a job. To print a poster is a job. To ink the printing press used for that job is an operation. An operation sheet provides the information required by a trainee in performing the operation. Operation sheets are prepared by the instructor.

Some representative operations which might be the subject of operation sheets are:

<u>Occupation</u>	<u>Operation</u>
Auto mechanics	Make a compression test on a motor.
Electrical	Thread a piece of conduit.
Machine shop	Sharpen a drill.
Plumbing	Cut pipe with a pipe cutter.
Printing	Ink a press.
Sheetmetal	Wire an edge.
Cosmetology	File fingernails.
Dressmaking	Make a mitered corner in a hem.

An operation sheet tells how to do something, just as the instructions that accompany a game tell how to play the game.

A good operation sheet must:

1. Be written in simple, clear, and concise language.
2. Be well illustrated, picturing each step or point that may cause difficulty.
3. Be arranged in good learning order just as the lesson itself is.
4. Emphasize safety and precautions at points where they apply.
5. Explain and, if possible, illustrate all new terms and names.

An operation sheet should be detailed enough and clear enough so that a capable trainee with the required experience can succeed by using just the sheet for guidance.

The operation sheet is a supplement to the instructor's demonstrations and instruction. It helps the normal learner to help himself after a demonstration has been given. It may serve as initial instruction for the brighter trainees who are capable of moving ahead of the others in the group. It helps the slow trainee by providing a means of reviewing the instructions previously given by the instructor.

OPERATION SHEET

School _____

Operation No.
Use same No. as in course of study.

Insert name of operation

SKETCH OR DRAWING: Provide drawing or make sketch if necessary.

MATERIALS: List materials needed to perform operation.

TOOLS AND EQUIPMENT: List tools and equipment needed to perform job.

PROCEDURE: State each step in the operation.

Steps should be stated clearly and concisely in occupational terms.

List steps in proper sequence.

Number steps consecutively.

Safety and key points should be listed with steps where they apply.

Double space between each step.

CHECK POINT: A check point may occur at any step in the procedure where the instructor desires to check the trainee before allowing him to proceed.

There may be more than one check point in the operation.

Place the words CHECK POINT in the left margin at the point in the procedure where the trainee is to be checked by the instructor before the trainee is to proceed with the next step.

SESSION FIVE
Part 2 of 2
60 minutes

INSTRUCTOR'S GUIDE SHEET

Practice Teaching Demonstrations 7 and 8

AIMS: These are the same as those for all teaching demonstrations.

SUGGESTIONS FOR PREPARING TO TEACH: These are the same as those listed in the instructor's guide sheet for demonstrations 1 and 2, page 43.

SUGGESTIONS FOR TEACHING: Follow the same procedure that was used for demonstrations 1 and 2, as described on page 43.

The following categories should be evaluated for these teaching demonstrations:

- A. Get Ready Points**
- B. The Four Steps**
- C. Oral Questions**
- D. Six Recommendations**

If a related information lesson is taught, evaluate it also for:

- E. Related Information Lessons**

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Teaching aids, their use and characteristics

AIM: To have each trainee develop an understanding of the purpose of teaching aids and how to use them.

MATERIALS: Handout Sheets 20, 21, 22, and 23. Lesson plans that were prepared and used by each learner. Paper for written test. Actual examples of specific types of aids.

I. PREPARATION of learner

Earlier lessons stressed the importance of making use of several senses to make learning more effective. Teaching aids help do that. Furthermore, some things are difficult to describe using just words, and a lesson often requires some type of visual aid. Finally, teaching aids can provide variety to help maintain interest.

A teaching aid is something that helps the instructor do his job, not something that replaces him; it should be fitted into all overall lesson plan with regard to its function.

II. PRESENTATION of information

A. Uses for teaching aids

1. TO SHOW SOMETHING HIDDEN in the object itself.
2. TO SIMPLIFY A COMPLEX DEVICE by rearranging its parts.
For example, a radio can be installed on a panel so parts are visible and circuits can be traced.

3. TO SHOW SOMETHING TOO LARGE to bring into class.
4. TO SHOW RELATIONSHIP OF PARTS.
5. TO SHOW SOMETHING TOO SMALL for entire group to see at once.
6. TO DEMONSTRATE A MOTION that is difficult to describe; for example, a cam's motion.
7. TO COMPARE NEW INFORMATION WITH OLD; for example, board feet compared to cubic inches.

B. The four types of teaching aids

Depending on what he wishes to accomplish, the instructor can use one or more of the four types of teaching aids in almost every lesson:

1. DISPLAY AIDS include chalkboard, pads of paper, posters, cartoons, flip charts, felt boards, and permanent wall charts large enough for the whole group to see.
2. PROJECTED AIDS are enlarged on a screen by a projector--slide, filmstrip, motion picture, opaque, or overhead.
3. THREE-DIMENSIONAL AIDS include the object itself, a part of it, mockups, and models.
4. DUPLICATED AIDS are printed to hand out to individual learners to keep.

C. Display aids

Display aids are used with the entire group at one time. [If possible, show actual examples as each one is discussed.]

1. Chalkboard or pads of large paper can be used for sketches, diagrams, outlines, definitions, directions, summaries, and assignments.
2. Permanent posters and cartoons arouse interest, attract attention, and are often used to stress one or more teaching points. They are particularly helpful in the preparation step for summing up information.
3. Wall chart is a general name for large permanent displays, either pictorial or with written data. A wall chart can help the instructor:

- a. Show what an object looks like.
- b. Show how parts work together.
- c. Teach relationships between wiring, hydraulic lines, pneumatic lines, and other technical components.
- d. Show useful data to entire group at one time.
- e. Show comparisons needed for making decisions on a job.
- f. Show progress of learners in the group--to motivate individuals and help in planning.

The nonpermanent chalkboard and pads of paper serve the same functions as posters, cartoons, and wall charts. In choosing a teaching aid the instructor needs to consider how many times it will be used and how much effort is required to make it. A simple drawing might best be made over and over on the chalkboard. A complicated drawing which requires a long time to prepare would probably justify a permanent form even if used only two or three times.

D. Projected aids

This type of aid is also for group instruction. The pictures used are smaller and easier to store and transport than display aids. [If possible, show equipment.]

1. Motion pictures provide realism and can be used:

- a. To give an OVERALL IMPRESSION.
- b. To AVOID NOISE DISTRACTION at the actual job.
- c. To SAVE A LONG TRIP to the job.
- d. To AVOID HAMPERING PRODUCTION by taking group to see the job.
- e. When it is SAFER to get PRELIMINARY VIEW from film.

2. A filmstrip projector uses transparencies on a roll of film that can be reproduced relatively inexpensively. Filmstrips on many subjects are available from educational and commercial film libraries. A script and/or record is often provided with a filmstrip.

3. A slide projector uses small slides mounted individually. This is particularly helpful when it may be necessary to add, delete, or rearrange slides during projection. Also, an instructor may be able to take his own pictures for a slide projector.

4. An overhead projector uses larger transparencies which can be altered more easily.

5. An opaque projector can show a small printed page or even a small object that has not been photographed.

E. Three-dimensional aids

Whenever possible, teaching should involve the object itself. However, some objects are too large, too small, too hard to get, or too hard to explain in their natural form, so models or mockups must be used. [If possible, show an example as each aid is discussed.]

1. A model can be seen, touched, examined, and often operated, so it is a particularly effective teaching aid. If a cutaway section is made, a model can show internal parts of the object.
2. A mockup is an unnatural layout or arrangement of the actual parts of a device, often mounted on a panel. Mockups are particularly useful for showing the relationship of parts and how the parts operate when power is applied.
3. An exhibit can show finished products, causes of scrap and waste, results of poor workmanship, and effect of breaking safety rules.

F. Duplicated aids

These aids include the information, assignment, and other sheets discussed in an earlier lesson. Duplicated aids are primarily for learners working individually under supervision.

G. Using teaching aids

This subject is too broad for complete coverage, but a few recommendations will be indispensable.

BEFORE THE GROUP MEETS:

1. PICK OBJECTIVES; decide exactly what each aid is to help teach. Do not try to teach too much using any one aid.
2. PREVIEW AIDS which were not developed for the specific lesson or course, because they may contain information that is unnecessary

or unacceptable. You may decide to show only part of a motion picture or other projected aid after you have previewed it.

3. REHEARSE the use of the teaching aid and plan explanation of it.
4. HAVE EVERYTHING READY, so time need not be wasted during session. For projected aids, check equipment and have a spare bulb. Arrange room for best viewing.
5. COMPLICATED CHALKBOARD DRAWINGS should be drawn before the session.
6. COVER DISPLAY AND THREE-DIMENSIONAL AIDS, so they will not be a distraction before they are used.

DURING SESSION:

1. DON'T LET THE AIDS BE A SUBSTITUTE for the instructor. Use aids, don't show them. Make explanations; ask questions. Have group members explain them.
2. SHOW EACH AID AT THE PROPER TIME during the lesson, but keep covered or hidden when not in use.
3. SPEAK TO THE GROUP, not to the teaching aid.
4. DO NOT PASS MODELS AROUND while they are being discussed. This procedure is distracting. Learners can see them up close later.
5. For a motion picture or filmstrip, EXPLAIN CLEARLY BEFORE THE SHOWING EXACTLY WHAT YOU WANT LEARNERS TO LOOK FOR. Otherwise, they may miss the important points. Require note-taking on major points in the film.
6. RESHOW ANY FILM OR OTHER TEACHING AID IF NECESSARY to teach a point that has been missed. [Distribute Handout Sheet 20.]

H. Obtaining teaching aids

The instructor can make or obtain a teaching aid. Possible sources for ready-made teaching aids include:

1. Schools and other local education agencies

2. Local industries and employers
3. Libraries
4. State departments of education, vocational divisions
5. Manufacturers of equipment
6. Supply houses
7. Agencies of the U. S. Government, in particular, the Office of Education, U. S. Department of Health, Education, and Welfare
8. Museums
9. Vocational education curriculum laboratories

[Distribute Handout Sheet 21.]

Many teaching aids are available for most major trades such as automotive repair, carpentry, and others.

I. Making teaching aids

1. The most effective teaching aids can be prepared by the instructor who knows what specific points he wants to teach, what terminology he wants trainees to learn, and just how he wants to use the aid.
2. When an instructor makes his own teaching aids, he first decides exactly what points he wants to teach, then he selects the kind of aid that best meets both his requirements and his capabilities.
3. A teaching aid should be simple and easy to understand. There are 10 characteristics of a good visual aid and 10 rules for using a chalkboard. There isn't time for learning all these during this course, so checklists are provided for use later. The checklists can save time and worry, as well as make teaching more effective.

[Distribute Handout Sheets 22 and 23.]

III. APPLICATION of information

[Explain that in a longer course trainees would usually have the opportunity to plan, make, and use in a lesson several different types of aids, but

because of time limitations and because the teaching demonstrations are almost over, they will not have such practice. Instead, application will be provided by making simple plans of aids and answering some questions. Have each trainee:

1. Look at his lesson plan and find two or three places where a display aid, projected aid, or three-dimensional aid might prove useful.
2. Select the particular kind of aid he thinks would be most useful for each such place.
3. List what he wants one such aid to accomplish--the specific information it should help him to teach.
4. Make a simple plan or sketch of that teaching aid.

While trainees work, provide individual assistance and advice. After 10 or 15 minutes, select one or two good examples and discuss them.]

[Oral Questions]

1. Why are motion picture films and filmstrips previewed before session time?
They often contain material instructor doesn't want to teach.
Instructor needs to decide what to emphasize and know where in film it will be shown.
2. What five things does the instructor do concerning audio-visual aids before the group assembles?
Decides what aids are to accomplish. Rehearses their use and plans comments. Gets everything ready. Draws complicated chalkboard drawings. Covers or hides display or three-dimensional aids.
3. Why does an instructor tell learners what they are expected to learn from a motion picture or filmstrip?
If they do not understand this beforehand, they will not learn important points. They may think the film is for entertainment.
4. What two things can the instructor do to really use an aid?
Make explanations and ask questions to determine if students have learned.
5. In what situations would an instructor reshew a film?
If students obviously had not learned what film was supposed to teach or when content cannot be learned in only one showing

IV. TEST

[Select three of the questions in the application step and have learners write answers on paper. Point out that the most definite proof of whether they have learned this information will come when they are actually teaching.]

USING TEACHING AIDS, A FEW RECOMMENDATIONS

Before the class meets:

1. Know what you want to accomplish. When using films or other aids you did not design, preview each one carefully to determine what to emphasize and what to ignore. You may find out you wish to show only a part of the film.
2. Rehearse the use of the teaching aid and plan comments.
3. Have everything ready so you will not have to waste group time fumbling around. For films, check projection equipment, have a spare bulb, arrange seats and screen for best viewing.
4. If chalkboard drawings are complicated, draw them ahead of time or have very light pattern on the chalkboard which you can follow.
5. Cover or hide display and three-dimensional aids so they will not distract the learners.

During the class session:

1. Don't let the aid be a substitute for the instructor. Use them, don't just show them. Make explanations; ask questions.
2. Show each aid at the proper time in the lesson, but keep it covered or hidden when it is not in use.
3. Speak to the group, not the teaching aid.
4. If models are used, do not pass them around while they are being discussed. This can be distracting, and learners can handle them later.
5. For a motion picture or filmstrip, make certain the learners know before the showing exactly what they are to look for. Otherwise, they may miss the important points, emphasize unimportant information, or consider the whole thing just a form of entertainment.
6. Reshow any film or other teaching aid if necessary to teach a point that has been missed.

SOURCES OF TEACHING AIDS

For most major trades and occupational areas, there is a large and readily available supply of teaching aids of one type or another. When planning a course or a lesson, contact the possible sources listed. If they do not have the actual aids, they may be able to direct you to an organization that does.

- Local industries and employers
- Employment offices
- Libraries and museums
- The vocational division of your State Department of Education
- Local school authorities
- Vocational curriculum laboratories at universities
- Manufacturers of equipment
- Supply houses
- Agencies of the U. S. Government, particularly, the Office of Education, U. S. Department of Health, Education, and Welfare, and the Government Printing Office.

Duplicated aids such as information sheets, assignment sheets, job sheets, training manuals, and teachers' guides for vocational subjects are available in wide variety. The booklet "Curriculum Materials for Trade and Industrial Education--1963" lists over one thousand such publications. It has 88 pages, price 35 cents. OE-84023A, Vocational Division Bulletin No. 303. It can be obtained from the U. S. Government Printing Office, Washington, D. C., 20402; or you may contact the Office of Education, U. S. Department of Health, Education, and Welfare, Washington, D. C., 20202.

U. S. Office of Education, Three-Dimensional Teaching Aids for Trade and Industrial Instruction, 1961, 46 pages, price 35 cents. OE-84024, Circular No. 662. Order from Superintendent of Documents, Government Printing Office, Washington, D. C., 20402; or Office of Education, U. S. Department of Health, Education, and Welfare, Washington, D. C., 20202.

CHARACTERISTICS OF A GOOD VISUAL AID

A visual aid is a specifically prepared drawing, model, or device that will expedite learning through the visual sense. When selecting or making a visual aid, the following points should be considered.

1. It should explain an abstract idea, show a relationship, or present a sequence or procedure that cannot be clarified without it.
2. It should be large enough to be clearly visible to everybody in the group. An aid is not an aid if part of the group cannot see it.
3. The lettering should be large and bold to avoid eyestrain from any point in the room. Avoid decoration and prevent distraction.
4. The wording should be easy for the learners to understand. Terms should be acceptable and in common use in the occupation itself.
5. The important parts should be accentuated by the use of bright color.
6. It should be made to scale, whether reduced or enlarged. The essential parts should be in proper proportions. Otherwise, the learner may be confused.
7. It should be constructed of good materials, so it can stand frequent use.
8. It should show evidence of good workmanship and be carefully finished in good taste.
9. It should be portable to permit its use in more than one location.
10. It should be protected with paint, shellac, glass, cellophane, or other protective materials.

HOW TO USE THE CHALKBOARD

Chalkboard work should be simple and brief. Copying lengthy outlines or lists of subject matter is a waste of time to instructor and trainee. If it is important for the trainee to have a copy of this material, it should be duplicated and distributed.

The chalkboard is similar to a store window. Everyone knows that an overcrowded, dirty, and untidy window display has little "stopping" value as compared to one that is clean and neat and displays a few well-chosen items.

The following rules for using the chalkboard should definitely increase its effectiveness as a visual aid:

1. Don't crowd the chalkboard. A few important points make a vivid impression.
2. Make the material simple. Brief, concise statements are more effective than lengthy ones.
3. Plan chalkboards ahead. Keep the layouts in your training plan folder.
4. Gather everything you need for the chalkboard before the group meets-- chalk, ruler, eraser, and other items.
5. Check lighting. Avoid chalkboard glare. Sometimes it will be necessary to lower a shade and turn on the room light.
6. Use color for emphasis. Chrome yellow and pale green chalk are more effective than white chalk.
7. Print all captions and drawings on a large scale. The material must be clearly visible to each trainee.
8. Erase all unrelated material. Other work on the chalkboard distracts attention. Use a board eraser or cloth, and not your fingers.
9. Keep the chalkboard clean. A dirty chalkboard has the same effect as a dirty window.
10. Prepare complicated chalkboard layouts before the group meets.

INSTRUCTOR'S GUIDE SHEET

Practice Teaching Demonstrations 9 and 10

AIMS: These are the same as those for all teaching demonstrations.

SUGGESTIONS FOR PREPARING TO TEACH: These are the same as those listed in the instructor's guide sheet for demonstrations 1 and 2, page 43.

SUGGESTIONS FOR TEACHING: Follow the same procedure that was used for demonstrations 1 and 2, as described on page 43.

The following categories should be evaluated for these teaching demonstrations:

- A. Get Ready Points
- B. The Four Steps
- C. Oral Questions
- D. Six Recommendations

If related information lesson is taught, evaluate it also for:

- E. Related Information Lessons

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Summary and review of teaching-learning sessions

AIM: To review what has been taught in previous lessons.

MATERIALS: Any teaching aids used earlier that are applicable.

I. PREPARATION of learner

A review session provides one more opportunity to repeat the most important points in a course of instruction, thus increasing the probability that the trainees will master those points.

II. PRESENTATION of information

A.. How people learn

Vocational instructors say that "If the learner hasn't learned, the instructor hasn't taught." These observations about the learning process will help you be an effective instructor.

1. **PRINCIPLE OF READINESS**--People learn best when they feel a NEED.
2. **PRINCIPLE OF EFFECT**--People learn best if they can expect and experience SUCCESS.
3. **PRINCIPLE OF PRACTICE**--The more a person does a thing, the better he can do it and the more he likes to do it.
4. **PEOPLE REMEMBER** and can use later about 90 PERCENT OF WHAT THEY SAY AND DO in training. They remember perhaps 70 PERCENT OF WHAT THEY SAY; ABOUT 50 PERCENT OF WHAT THEY HEAR AND SEE. To put it another way: By themselves, neither showing nor telling is very effective. Together, they are better. Combined with having the trainee do something, they are quite effective. If he also tells the instructor what he is doing and why, the learner has the best possible chance of success.

5. People learn best NEW THINGS IN TERMS OF THE OLD.
6. For a number of reasons, PEOPLE LEARN different things AT DIFFERENT RATES.

B. The four-step plan

Like any job, teaching a lesson should be done following certain steps and key points. The four-step plan of instruction is a sound basis for making use of your understanding of how people learn.

1. In Step I, Preparation, you convince the learner that he needs to learn, you put him at ease, state the job, find out what he knows, and place him in the correct position.
2. In Step II, Presentation, you tell, show, demonstrate, illustrate, and question in order to put over the new knowledge or operation. You teach slowly, clearly, completely, and patiently one point at a time. You check, question, and repeat, making sure the learner really learns.
3. In Step III, Application, the learner does something. He performs the job or uses the information while the instructor questions, observes, corrects errors, repeats instructions if needed, and makes certain that he is learning.
4. In Step IV, Test or Follow-up, the learner is put on his own under close supervision. The supervision is gradually tapered off. For related information lessons, the learner may be required to complete a written test.

C. Oral questioning

1. Spoken questions serve two main purposes. They can be used to find out if the instruction is succeeding. They also help trainees learn, because trainees tend to remember quite well what they personally said during training. Questions can also motivate the learner, find out what he knows, keep attention, and clarify a point.
2. A good question should require thought, should be brief and easily understood, should cover only one main thought, and should have a specific purpose.
3. When questioning:
 - a. State the question;

- b. Pause so that everyone can think; then
- c. Select a person to answer it.

D. Teaching adults

Adults differ in interest, intelligence, experience, ability to concentrate, sense of well being, ability to remember, imagination, and self-confidence. Each of these influences how fast and how well a person learns and what the instructor must do to teach him.

The adult learner usually:

1. Can see relationships between what he knows and what he is studying.
2. Is eager to apply what he has learned.
3. Is serious and almost always seeking a specific goal.
4. Is less inclined to be impulsive; requires time to think through processes and problems.

E. Six specific recommendations

These recommendations, all based on how people learn, will make your teaching more effective.

1. Provide long-range goals as well as immediate aims.
2. Teach from the known to the unknown.
3. Tie knowledge and skill together.
4. Proceed from simple to complex, easy to difficult.
5. Reward success.
6. Provide practice and repetition.

F. Group vs. individual instruction; aids for directed activity

1. Group instruction saves time, provides uniform instruction, bolsters team spirit, motivates individuals, is helpful for teaching basic principles, and can be used for skill lessons for a small group.

2. Individual instruction makes it possible to overcome differences between people. It is frequently used in Step III, Application. Individual instruction is probably more thorough, is geared to learning speed, is easier, can be used for remedial work, and makes possible varied instruction techniques.
3. Frequently, both group and individual instruction are used in a lesson: Steps I and II with the group, Step III with individuals.
4. In directed activity the instructor puts the learner on his own under thorough supervision. For directed activity the instructor can use assignment, information, job, job plan, and operation sheets.

G. Teaching aids

1. A teaching aid helps the instructor; it does not replace him. It can help make use of an additional sense, usually sight. An aid may be the only way to teach some things which can't be described adequately with words.
2. Basic points about aids:
 - a. They should be planned to meet a specific need, using the type of aid that best does the job and best fits the instructor's capabilities.
 - b. There are many sources of teaching aids.
 - c. In making an aid, the instructor should be certain that it is well designed and constructed, with lettering large enough to be easily read by entire group. Other check points for use in producing an effective aid were covered in a handout sheet.
 - d. To use an aid effectively, the instructor must plan exactly how and when it is to be used and have it ready when it is needed.
 - e. Teaching aids can be distracting, so keep them hidden when not in use.
 - f. Motion pictures, filmstrips, and other aids prepared by someone else should be previewed before use. They often have unnecessary or unacceptable content.

H. Looking ahead

This completes the summary of teaching and learning. Like any other job, each job of teaching must meet trade standards. The next unit is intended to teach you how to determine if each teaching job you do is of sufficiently high quality.

III. APPLICATION of information

[Conduct a group discussion of the following questions.]

1. Why is it helpful for trainees to tell what they are doing when they do a job?

People tend to remember best what they both do and say.

2. Why is the four-step plan used for both the manipulative and the technical information areas?

The four-step plan is based on the principles of learning, which apply to lessons on skill or related information. The plan has long been in general use for vocational education, and its effectiveness is well established.

3. State the principles of readiness, effect, and practice.

Readiness--people learn best when they feel a need for learning.

Effect--people learn best if they expect and experience success.

Practice--practice is an essential part of learning.

4. Tell what the instructor should do in each step of the four-step plan.

Step I--convince learner of need to learn, put him at ease, state goal, find out what he knows, place him in correct position.

Step II--tell, show, demonstrate, illustrate, and question in order to put over new knowledge; teach slowly, clearly, completely, and patiently one point at a time; check, question, and repeat to be sure trainee learns.

Step III--have learner apply information or practice skill while instructor observes and checks performance; reteach if needed.

Step IV--for related information, provide a test. Put learner on his own and gradually withdraw supervision. Tell him where he can get help.

IV. TEST

[Stress that the test or follow-up step for this session will come when learners are back on the job, and they will be "graded" by their success as occupational instructors.]

OUTLINE FOR UNIT III, EVALUATION AND TESTING

(Recommended time: $2\frac{1}{2}$ hours in one session)

	<u>Page</u>
Lesson Plan, Objectives of Evaluation and Testing (60 minutes)	135
Lesson Plan, Preparing Tests (90 minutes)	143

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: The objectives of evaluation and testing

AIM: To develop an understanding of the responsibilities the instructor has for evaluating his trainees' progress and his own performance.

MATERIALS: Handout Sheet 24. Paper for written test.

I. PREPARATION of the learner

Lessons and courses should have specific objectives, and certain standards should be met before instruction is considered successful. Like any craftsman, the instructor must make periodic checks to determine if progress is satisfactory.

II. PRESENTATION of information

A. Definition of tests

A test or examination is any means used to measure student performance.

Tests can:

1. Evaluate achievement of a learner.
2. Measure the effectiveness of teaching.
3. Assist in the learning process by pointing out errors and weaknesses that need correction.

Without some form of test, the instructor cannot be certain that he and the learner have reached their objectives.

B. The primary goal--evaluating learner achievement

The occupational instructor preparing an applicant for a specific job should first determine the objectives against which success must be measured. Periodically, he must then test to see:

1. If specified skills are being developed; if the trainee meets or shows promise of meeting trade standards. This is done by observing performance on a job or by judging completed work. Progress charts will be helpful for keeping a record of each skill mastered by each learner.
2. If knowledge, insight, and understanding are acquired. This is done through use of written tests or oral questioning, which may evaluate both ability to recall certain information and ability to use that information.

C. A testing bonus--evaluating instruction

By giving a test at the end of each lesson and each unit, the instructor can judge if:

1. The sequence of lessons is effective.
2. A lesson plan provides adequate treatment of subject.
3. More or better teaching aids are needed.
4. The lesson plan is appropriate for the job and trainee.
5. The appropriate method or methods were employed; techniques used were effective.
6. Earlier tests really measured achievement and progress.
7. Some things should be retaught.

D. Observation and evaluation of learner attitudes

Because attitude of an employee is vital to keeping a job, the occupational instructor should observe each learner during the course while there is time for counseling and correction. Ask these questions of yourself about each learner:

1. How does he follow direction?
2. How does he take criticism?
3. How does he get along with co-workers?
4. Can he adapt and adjust to different situations?
5. How will his dress, mannerisms, and language impress employers and other workers?

E. Critical decisions about learners the instructor will face

The occupational instructor will make certain difficult decisions about trainees. He may have to decide:

1. When to discipline.
2. When to counsel a learner about a particular failing.
3. When to drop a trainee.
4. When and if he should certify a trainee for work.

Careful evaluation and testing may also show that a trainee has unusual promise and should receive additional work to develop his special capabilities.

F. Evaluating trainee-instructor relationships

The instructor needs to study patterns of his relationships to individual trainee's problems. He should review results of specific counseling actions.

G. Self-evaluation

The instructor must often take an analytical look at his own performance. He may need to decide whether to:

1. Modify his teaching procedures.
2. Modify his personal behavior.
3. Seek assistance.

4. Withdraw from the training program because of lack of sufficient interest.

H. Summary

The instructor must make many decisions based on evaluation and testing. If he does not use a sound approach, he cannot be certain the learner will achieve stated objectives in terms of skill, knowledge, and attitude. Part of his evaluation, particularly that involving attitudes, is based entirely on observation. It is possible, however, to design and use tests to provide greater accuracy when measuring achievement of skill and attainment of knowledge.

III. APPLICATION of information

[Ask the following questions, getting several learners to answer each. Also, ask each learner to make notes on how he would have answered.]

1. List four specific skills that you will require your trainees to master. These will vary by occupation.
2. List several general areas of related information in which learners will be expected to master specific facts. These will vary by occupation.
3. Which of the seven questions given for your use in evaluating attitude do you think is most important in your occupation? Which is second in importance? Which is least important? The seven questions are: How well does he follow direction? How does he take criticism? How does he get along with his co-workers? Can he adapt and adjust to different situations? How will his dress, mannerisms, and language impress employers and other workers? Ranking will vary with occupation.
4. In addition to self-evaluation, how can an instructor evaluate his own performance? Discuss it with his supervisor. Get the opinion of a fellow instructor. Find out the reaction of employers who employ his trainees.

IV. TEST [Written]

1. When a learner is tested for the development of a skill, why should he be given a manipulative test rather than a paper-and-pencil test?
Skill is being tested, not knowledge.
2. How can one tell when the objectives of a course have been met?
By a test at its conclusion
3. What are two ways in which the instructor can evaluate the attitude of his trainees?
Observation and interviews
4. List four difficult decisions an instructor might have to make about a trainee.
When to discipline. When to counsel a learner on a particular failing. When to drop a trainee. When and if he should certify the trainee for work.

PURPOSES OF TESTING AND EVALUATION

Like any other craftsman, the instructor of an occupation is working to achieve specific, measurable results. To decide whether each lesson, series of lessons, or complete course is successful, the instructor must use tests and careful evaluation that compare actual results with desired objectives.

TESTS SHOULD BE DESIGNED AND GIVEN IN ORDER TO:

1. Find out if the learner is developing the skills required for the occupation.
2. Find out if the learner can remember and use the related information demanded.

EACH LEARNER SHOULD ALSO BE EVALUATED AS TO WHETHER:

1. He follows directions well.
2. He takes criticism well.
3. He gets along with his co-workers, the other learners.
4. He can adapt and adjust to different situations.
5. His dress, mannerisms, and language are acceptable in the occupation for which he is trained.

STRICTLY AS A BONUS, TESTS HELP THE INSTRUCTOR EVALUATE HIS INSTRUCTION. A TEST CAN HELP YOU DECIDE IF:

1. The sequence of lessons is effective.
2. A lesson plan provides adequate treatment of the subject.
3. More or better teaching aids are needed.
4. The lesson plan is appropriate for the job and trainee.
5. Earlier tests really measured progress.

The occupational instructor may also need to evaluate himself and his trainees when making certain basic decisions.

ABOUT PARTICULAR LEARNERS, HE MAY NEED TO DECIDE:

1. When to discipline.
2. When to counsel a learner on a particular failing.
3. When to drop a trainee.
4. When and if he should certify a trainee for work.
5. If a particular trainee has unusual promise and should be given additional work to develop his special capabilities.

AFTER EVALUATING HIS OWN PERFORMANCE, THE INSTRUCTOR MAY NEED TO DECIDE WHETHER TO:

1. Modify or adjust his teaching procedures.
2. Modify or adjust his personal behavior.
3. Seek assistance.
4. Withdraw from the training program because of lack of sufficient interest.

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Preparing tests

AIM: To help the trainee instructors develop the ability to prepare written tests for related information and performance tests for skills.

MATERIALS: Handout Sheets 25 and 26.

I. PREPARATION of learner

Tests are useful to the instructor throughout a course. In Step IV of a lesson, a test helps determine if each learner has succeeded and is ready to proceed--and if the teaching was effective. Success in passing a test will encourage the learner to continue. Failure can show him where he needs to improve. Because a [lesson] test measures the trainee's achievement immediately following a lesson, it may not show whether he will retain skill or information over a long period. For that reason, subsequent tests at the end of each unit or at the end of a course are needed to measure retention.

II. PRESENTATION of information

A. Preparing a test

A good test starts with the answers or results. The instructor must first decide exactly what the lesson, unit, or course is intended to teach. He may even need to list each teaching point or to determine exact standards for skill tests. He then has to devise a test that will compare results to stated objectives.

B. Types of tests

There are three basic kinds of tests:

1. Oral quizzes--used with an individual to see if he has mastered a lesson
2. Written tests--to measure how well each person has learned related information
3. Performance tests--to measure skills achieved

C. Qualities of a good test

A GOOD TEST has these qualities:

1. It MEASURES ACCURATELY the trainee's understanding or skill.
2. The questions and directions are CLEAR, CONCISE, and COMPLETE.
3. It is EASY TO GIVE, EASY TO TAKE, EASY TO CORRECT, and EASY TO SCORE.
4. QUESTIONS are VALUED FAIRLY and accurately.

D. Testing related information

1. To determine if trainees retain information or can apply information, the instructor uses oral quizzes or written tests. With a group a written test is preferable, because it can test each individual more thoroughly.
2. The teaching points in a lesson plan provide the subject matter for testing. Instructors often start by first writing statements to cover each testing point, then using the statements as a basis for questions on the test. There are two basic types of questions:
 - a. Objective--These can usually be answered with a single word, letter, or number.
 - b. Essay--These require the learner to write a longer answer, often in essay form. Essay questions tend to emphasize writing ability.
3. Preparing objective questions [Distribute Handout Sheet 25. Present the information on objective questions while learners look at examples.]

4. Preparing essay questions--A poorly written essay question can be difficult to grade and unfair to the trainee. [Use Handout Sheet 25 as a reference while presenting the five points on essay question preparation.]

E. Testing skills

Skills are tested by having the learner perform a job or operation under the observation of the instructor. Performance tests must be planned carefully if they are to measure accurately whether the learner meets the required standards. [Distribute Handout Sheet 26.]

In preparing to give a performance test:

[Discuss the six points given in Handout Sheet 26.]

When giving a performance test, ensure each learner an equal opportunity by:

[Discuss the six points given in Handout Sheet 26.]

III. APPLICATION of information

[Have each trainee-instructor prepare both a short written test and a short performance test. One of the tests should be based on the lesson plan used for his demonstration lesson. Help individuals as needed. Select several tests of each type for group discussion.]

IV. TEST [Written]

1. List the three basic kinds of tests. Tell the special purpose of each.
Oral quiz--for information lessons, given to an individual
Written test--for information lessons, given to members of a group
Performance test--for skill lessons
2. List the four qualities of a good test.
It measures accurately the trainee's understanding or skill.
Questions and directions are clear, concise, and complete.
It is easy to give, easy to take, easy to correct, and easy to score.
Questions are valued fairly.

3. What are the six things an instructor does in preparing to give a performance test?
 - Determines exactly what elements he wants to test.
 - Lists the steps in the job, together with key points for each.
 - Decides acceptable standards for performance of each part of the job.
 - Prepares directions to give the learner.
 - Prepares a scoring sheet for use when giving the test.
 - Lists and makes available the things which the trainee will need to take the test.

4. How can the instructor ensure each learner an equal opportunity when giving a performance test?
 - Make certain directions are understood.
 - Make certain required standards are understood.
 - Have working conditions as nearly identical as possible.
 - Evaluate each element accurately and fairly.
 - Avoid making trainee tense; avoid giving assistance other than that needed to clarify directions.

WRITTEN TESTS

Related information lessons should include a written test in the final step. Written tests are also usually given at the end of a unit and a course to determine how much each learner retains.

Two basic types of questions are used in written tests, but tests are often made up of only one of the types. Objective questions are written so they can be answered with a single word, letter, or number. Properly prepared, they can be graded quickly and with great accuracy. Essay questions require the learner to write a longer answer, often in essay form. Such questions can sometimes give misleading results, because the trainee's ability to express himself becomes an important though unwanted factor.

PREPARING OBJECTIVE QUESTIONS

Simple recall questions ask for a short response to definite questions. Examples:

Write the answer to each question in the space at the right.

1. How many threads per inch has a $\frac{1}{4}$ " NC screw? 1. _____
2. What make of carburetor is used on a GMC 270 truck? 2. _____
3. How high is foundry type? 3. _____

True-false questions ask the learner to indicate whether statements are true or false.

1. Because guesses have a 50-50 chance of being right, such questions are not as accurate as other objective questions. If used, there should be a relatively large number of questions, and there should be approximately the same number of true and false questions distributed at random.
2. Avoid the use of words such as "always," "never," "usually." They tend to give away the answer.
3. For accurate scoring, subtract the number of incorrect answers from the number of correct answers.

Examples:

Read each statement carefully. Decide whether it is true or false. Print the word "true" or "false" in the column at the right after each statement.

1. The density of battery electrolyte is measured with a voltmeter. 1. _____
2. New York is one of the states requiring tests of driving license applicants. 2. _____
3. A rising barometer reading indicates the approach of clearing weather. 3. _____

Enumeration or "list" questions can be used if the desired answer has several unchanging parts.

Examples:

A. Name in proper order the strokes of the Otto cycle, using the spaces provided.

1. _____

2. _____

3. _____

4. _____

B. Name the principal components of mortar, using the spaces provided.

1. _____

2. _____

3. _____

A matching question provides two lists, and the learner is required to mark the items on one list which are most closely related to specific items.

1. Only a code letter or number needs to be written.
2. The two lists have unequal numbers of items, but each item should have only one correct answer.

Examples:

Place numbers from the list at the left on lines at the right to show which word best fits the statement.

1. Toughness
2. Elasticity
3. Malleability
4. Ductility
5. Hardness

- A. Property of metal that permits drawing, etc. _____
- B. Property of metal that permits stretch under tension without breaking or tearing. _____
- C. Property of metal that permits return to original form after deformation ceases. _____

In a multiple-choice question the trainee must select the most appropriate answer from a minimum of four possible answers.

1. Care should be taken to provide only one correct answer, although all suggested answers should appear plausible or possible choices.
2. Each choice offered should be listed on a separate line.
3. Do not include any choice that is obviously or ridiculously wrong.
4. Avoid giving away the answer by using "a" or "an."

Examples:

From each group of suggested answers, choose the one you consider best for the statement. Put a check mark on the correct line to show your choice.

1. The size of wood screws is usually expressed in
 - a. gauge size.
 - _____ b. fractional parts of an inch.
 - _____ c. decimal fractions.
 - _____ d. millimeters.

2. The pitch of a screw is the
 - _____ a. number of threads on the screw.
 - _____ b. distance between threads.
 - _____ c. angle between thread faces.
 - _____ d. diameter of the threads.

Completion questions require the learner to write in a blank the word or number that completes the sense of the statement.

For easier checking, the answer may be written in a code-number column at the right or in both the blank and the column.

Examples:

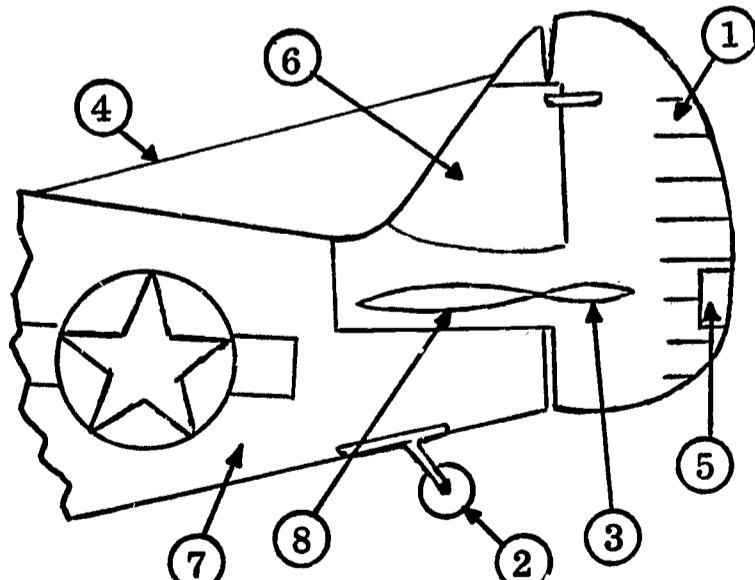
Fill in the spaces with the word or number to make the statement complete.

1. Wearing _____ will prevent most eye injuries. 1. _____
2. The ignition is part of the _____ system of a car. 2. _____
3. The smallest division on a micrometer is _____ of an inch. 3. _____

Identification questions, which require the learner to identify or label various parts of a drawing, not only arouse interest, but are quite effective in testing his understanding of new terms.

Examples:

Put the number of each part in its named box at the right.



Antenna	_____
Elevator	_____
Exhaust stack	_____
Fuselage	_____
Pitot tube	_____
Rudder	_____
Stabilizer	_____
Tail wheel	_____
Trim tabs	_____
Vertical fin	_____

WRITING ESSAY QUESTIONS

Essay questions are deceptively easy to write but can be quite difficult to grade. Too often the instructor writing an essay question goes on a "just-fishing" expedition, scribbling down something like "What do you know about gasoline engines?" Correct answers to that one can vary from "Nothing" to a chapter of handwritten material that takes forever to grade. Using more care in writing questions can save much time in grading and will be fairer to the learner. These recommendations will help in writing essay questions that are fair to the learner and relatively easy to grade:

1. Prepare questions that require short answers. Those that demand lengthy answers take too long to correct. A question can be kept short if it does not involve too many ideas. If several ideas are involved, subdivided the question.

Good: Why use flux in welding? (10 points)

What is an alloy? (2 points) Give three examples.. (2 points)

Give the composition of each alloy. (6 points)

Poor: Explain the electron theory.

2. Make questions specific. State what is wanted and how much detail is desired.

Good: Paint is made up of a vehicle and a pigment. Give two examples of each.

Poor: In broad terms describe what takes place when soluble oil is mixed with water.

3. Prepare questions that in themselves are not too long and involved.

Good: When two different size gears rotate in mesh, what is the relative speed of the smaller gear?

Poor: Some automobiles are equipped with standard transmissions which incorporate a gear-selector lever for the driver to achieve greater flexibility of speed and power; how is this accomplished?

4. Avoid questions that suggest the desired answer by using such words as "always," "never," and "seldom."

Good: Give two reasons for setting the hand brake on a car when parking.

Poor: Is there something to be gained by always setting the hand brake on a car?

5. Finally, the writer of a question already knows what he means, but what is clear to him may not be clear to another person. It's helpful to let another instructor read the questions to see if he understands each of them.

PERFORMANCE TESTS FOR SKILLS

A performance test is used to decide whether a trainee can perform a skill--or do a job or operation--well enough to meet the standards of the occupation. Such a test should never be just a haphazard observation of the trainee doing a job. Instead, a performance test must be carefully planned and given if it is to provide an accurate evaluation of the trainee's accomplishments.

PREPARING TO GIVE A PERFORMANCE TEST:

1. Determine exactly what elements you wish to test. Are safety and precautions used? (Always important) Speed? Ability to plan work? Accuracy? Exactness in following steps and key points? Skill and confidence in using tools? Craftsmanship?
2. List the operations in the job or steps in the operation. The job or operation sheet may already contain such information.
3. By consulting the steps and key points in the job or operation, decide the acceptable standards for each element that is to be tested. Decide the relative value of each element.
4. Prepare directions to give the learner. Written directions are best since they can be standardized to give each trainee an equal chance.
5. Prepare a scoring sheet for use when giving the test. This will provide a standardized guide when observing and evaluating the performance of each learner. The design and content of such a sheet depend on what is being tested. Some sheets give a numerical value to each element tested, while others simply indicate whether trade standards were met.
6. List and make available the materials, tools, equipment, specifications, and plans which the learner will need to perform the test.

OUTLINE FOR UNIT IV, ORGANIZATION AND MANAGEMENT

(Recommended time: 2 hours in one session)

	<u>Page</u>
Lesson Plan, Initiating and Opening Course (60 minutes)	155
Lesson Plan, Shop and Classroom Organization and Management (60 minutes)	167

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Initiating and opening a course

AIM: To teach the occupational instructor what he must do before the first session.

MATERIALS: Handout Sheets 27 through 30. Paper for written test.

I. PREPARATION of the learner

The success of any training course is partly dependent on what is done before the first session, when the instructor takes care of the many details and detailed plans vital to smooth operation of the course. Even though every course will differ slightly as to exact preparation required, there are factors which must be considered in all cases. This lesson will help you find out what information you should obtain about your particular course. The information sheets provided will make convenient checklists for later use.

II. PRESENTATION of information

A. Mutual arrangements to make

The occupational instructor may have to share shop or classroom facilities with another instructor. Even if he has his own shop or room, instructor will probably need to cooperate with school or company officials on certain matters. In either case, the instructor should make mutual arrangements and have an understanding with the appropriate person or persons regarding several matters. [Use Handout Sheet 27 as a reference for the eight teaching points. Do not distribute it yet.]

B. Surveying and inventorying facilities and equipment

The occupational instructor is responsible for both the safety of his trainees and the condition of the equipment and facilities used. If he is negligent, the instructor may be held legally liable for injury to a trainee, and he is almost always subject to disciplinary action from his employer. Before he assumes responsibility for either facilities or the safety of trainees, the occupational instructor should make an inventory of facilities, equipment, and supplies, as well as survey and correct any unsafe conditions. [Use Handout Sheet 28 as a reference for the teaching points. Do not distribute it yet.]

C. Requisitions, reports, and records

The instructor should find out as soon as possible exactly what records, reports, and requisitions he must prepare. Although some records and reports are used by most programs, others are only required locally. [Use Handout Sheet 29 as a reference for teaching points. Do not distribute it yet.]

D. Select jobs and trainee work

1. Because his goal is employment in a specific occupation, the learner should be taught with equipment, tools, and materials currently used in that occupation.
2. Trainees are motivated more strongly by jobs that produce useful results.
3. Specific jobs for training are selected before a course begins in order that arrangements can be made for obtaining what is needed before it is to be used.

[Use Handout Sheet 30 as a reference for teaching points. Do not distribute it yet.]

III. APPLICATION of information

[Discuss each of the four handout sheets. A suggested approach follows:

1. Distribute Handout Sheet 27. Allow trainees time to look it over to see what information on it they already have. Ask each trainee to discuss what he knows, needs to know, or should decide upon concerning arrangements.

2. Distribute Handout Sheet 28. Have trainees study it. Ask each one what materials, tools, or equipment he will probably have or need. Also ask what unsafe conditions are most likely to be found in the type of shop situation encountered in his occupation.
3. Distribute Handout Sheet 29. Allow time for trainees to look over the sheet, then ask each if he knows of any specific paperwork that will be required of him in his particular program. For learners who are not yet certain, ask what requisitions, reports, or records they think will most likely be required in their particular programs. Caution that it is important to find out for certain. Discuss the four recommendations.
4. Distribute Handout Sheet 30. Ask for two reasons why it is important for actual jobs from an occupation to be used in training. Ask each learner to consult the "teaching factors to consider" when selecting jobs; then make a list of the jobs he thinks he will use in his course. Select several jobs and lead a discussion of whether they meet the requirements. Give learners a chance to review the management responsibilities of an instructor. Then lead a discussion of each of the seven points.]

IV. TEST [Written]

1. List five things which the instructor may need to find out or decide with the help of other people before his first group meets.

Answer is on Handout Sheet 27.

2. What are the three objectives of a precourse inventory and a safety survey?

A list of all items and their conditions will avoid unfair blame on the instructor for their loss or damage. List will make it possible to order any equipment or supplies needed. Instructor will know what equipment or tools need to be put in operating order. Instructor will be able to correct hazardous conditions.

3. List 10 conditions which might be discovered in a thorough safety survey of a shop.

Answer is on Handout Sheet 30.

MUTUAL ARRANGEMENTS TO MAKE BEFORE FIRST SESSION

The occupational instructor must know which management and other non-teaching responsibilities are his, which belong to other individuals, and which are shared. He also must have certain information before the course begins. The occupational instructor should consult and cooperate with the other people involved to get answers to the following questions:

1. What times can shop and classroom facilities be used by his group and its members? When is the room available for regular sessions? When can he use it to get ready for a session? When can trainees practice, drill, or study in the room?
2. To what extent is he accountable for loss or damage to tools, equipment, and supplies? What procedure can be worked out to minimize loss and breakage?
3. Where and how can he get parts and other necessary items when the usual supply channels are closed? Whom can he call after hours? Can he buy parts or supplies and be repaid?
4. Where and how should he report damage, loss, and need for repairs?
5. Who is responsible for custodial services? What cleanup and put-away services should his group provide such as closing windows, putting away equipment and tools, and others?
6. What storage is available for coats and other personal belongings; for teaching aids, notebooks, and similar items; for jobs and operations used in training?
7. What should he do in emergencies? Where are fire alarms, extinguishers, hoses, and fire escapes? Where can he get help in case of fire? Where are first-aid kits? Are there trained individuals, such as a school nurse, who might assist. How can he get ambulance service if needed? Where should he report fires and accidents?
8. When he finds fire hazards or safety hazards, how can he get them corrected? Who is responsible for correcting them?

PRECOURSE INVENTORY AND SAFETY SURVEY

Before assuming responsibility for the tools, equipment, and supplies that will be used in his course, the occupational instructor should make a careful and complete inventory. The objectives are to:

1. Provide a list of all items and a description of their conditions, so that he will not be held unfairly responsible for loss or damage.
2. Make it possible to order any missing equipment or supplies needed. Unless they are available at the right time, equipment and supplies are useless.
3. Make it possible to arrange for all tools and equipment to be put in satisfactory operating order. Trainees should not use tools and equipment which are not functioning properly.

In addition, the instructor should conduct a safety survey. Here are some conditions which the instructor should look for when surveying a shop area for potential hazards:

HAND TOOLS that are:

1. Dull or otherwise worn
2. Without proper handles
3. The wrong size or kind for jobs planned

MACHINES that are:

1. Too close together
2. Without proper safeguards
3. Broken
4. Improperly adjusted
5. Insufficiently lubricated
6. Too small or weak for the job
7. Equipped with dull knives or cutters

SHOP CLOTHING that is:

1. Inappropriate
2. In poor condition
3. Loose or flowing

MATERIALS that are:

1. Inflammable
2. Poisonous
3. With sharp or jagged edges
4. Stored in a dangerous way

The instructor should know and practice the necessary handling precautions for all materials.

DANGEROUS CONDITIONS such as:

1. Exposed electrical wiring
2. Holes in the floor
3. Projecting objects
4. Unstable or broken ladders or scaffolds
5. Defective hoisting equipment
6. Slippery floors
7. Inadequate lighting
8. Insufficient ventilation or poor exhausting of dangerous fumes

SAFETY EQUIPMENT (first-aid kits, fire extinguishers, rubber mats, goggles) which is:

1. Inadequate
2. Too old or inoperative
3. Too difficult to find or reach

A complete safety survey of a shop will take time, but it is crucial because of the need to protect both the learners and the instructor. An instructor is subject to disciplinary action from his employer for letting unsafe conditions continue, and he may be legally liable for negligence that contributes to an accident. It isn't enough to find and report unsafe conditions--they must be corrected!

REQUISITIONS, REPORTS, AND RECORDS

Depending on the type of course in which he is involved, as well as on the school and other organization with which he works, the instructor will do a varying amount of paperwork. In some situations the instructor may be partly responsible for finding out what is required of him. Before he starts actual teaching, the instructor should determine the kind of paperwork that will be necessary. Common types are requisitions, reports, and records.

REQUISITIONS are filled out and submitted to obtain supplies, equipment, materials, and services such as the repair of machines. A school or other organization may require special requisitions for:

1. Regular supplies or materials.
2. Equipment or tools.
3. Emergency purchases.
4. Repair work.

Equally as important as knowing what types of requisition is needed, and how to complete it, is knowing who should receive the completed form. Understanding and using "channels" will help speed results.

REPORTS are prepared by the instructor to inform someone else. A report may go to local, state, or federal authorities--to school, company, or governmental officials cooperating in a training program. Reports may be required for:

1. Accidents.
2. Attendance.
3. Enrollment at the start of a course.
4. Number of successful trainees and their names.

RECORDS are kept by the instructor for his own use, but may be required to back up something in a report, to justify expenditures or decisions, or to show that training and shop management were conducted in the proper way. Common types of records show:

1. Attendance at each session and for each individual.
2. Progress of each individual during the course.
3. Jobs performed by each trainee to develop skills.
4. What books and other teaching materials are checked out.
5. Use of supplies and materials.
6. Conditions, breakage, and loss of tools.
7. Repair, servicing, oiling, and other maintenance of machinery.

The inventory made at the beginning of a course is an important record, and it may be desirable to make a similar inventory when training is completed. Also, the safety survey and resulting actions taken to correct hazardous conditions could be a useful record in some situations.

PREPARING RECORDS, REPORTS, AND REQUISITIONS

Regardless of the nature of the specific type of paperwork required of a particular instructor, there are certain recommendations that will always prove helpful.

1. All paperwork should be accurate, complete, neat, and legible.
2. Because of the need for accuracy and completeness, and because human memory is not entirely reliable, it is important to gather data on an "as-you-go" basis. Whenever something occurs that should be recorded or reported, write yourself a note.
3. Reports should be filed promptly, so make a point of allowing yourself plenty of time to prepare each report. It might be possible to use an assistant from the class to help with the detail work of keeping records and making reports.
4. Don't forget that a record is useless unless it is in a place where you can quickly and easily get it. File records in a way that will make it easy to retrieve them.

FACTORS TO CONSIDER IN SELECTING JOBS FOR TRAINING

Learning is more effective if the learner is motivated. Most people balk at cutting an eight-foot 2 x 4 into short lengths just to acquire skill in using a saw. But the same people can be kept interested if they perform a carpentry trade job--or series of jobs--in which they use a saw often enough to develop the required skill. That is one reason why training should involve the learners in doing the actual jobs currently used in the occupation. In addition, learning should take place under conditions experienced in the occupation if trainees are to be prepared realistically for what they must face later.

The occupational instructor is selected because of his knowledge of the skills and jobs which must be mastered. He knows each job, which skills are demanded for each job, and the relative difficulty of each job. At one time it was necessary for most instructors to develop their own analysis for each occupation, but today many complete analyses are available from state, local, and national organizations. With such a list, the instructor may need only to select and arrange the jobs for his particular course. In that task, he can often make use of expert assistance from a local committee of tradesmen.

Whether the jobs were selected beforehand, whether the instructor must carry out that assignment, or whether he has help from a committee, certain factors involving the teaching value of each job are involved.

TEACHING FACTORS TO CONSIDER

1. Jobs should be selected on the basis of their applicability. Do they teach what the individual needs to know to obtain and hold a position in the occupation?
2. Jobs should be selected while considering specific skills involved. Because a learner may not get enough practice in a skill such as sawing; or on a particular job such as cutting a rafter, it is important to have enough jobs to teach each skill required.
3. Each job should be evaluated as to its relative difficulty. Effective teaching demands that jobs be taught in easy-to-difficult or simple-to-complex order. When evaluating specific jobs as to relative difficulty or complexity, the instructor may need to consider requirements as to speed, accuracy, finish, muscular coordination, knowledge, and judgment. Other factors may be involved, depending on the job and occupation.

4. As far as possible, each job should produce a useful result. This policy will help motivate each learner to do his best. For example, a person is naturally more interested in repairing a carburetor that will be installed on a car than he is in doing the same job on a carburetor that will be returned to the storeroom. He needs the feeling of useful accomplishment and the challenge of doing the job to meet standards.

MANAGEMENT RESPONSIBILITIES

After he has selected the jobs that fit his teaching needs, the instructor will still have additional information to gather and decisions to make.

1. He will need to know where to obtain materials, equipment, and supplies.
2. He will need to determine what paperwork is necessary.
3. In the case of a production job that results in finished articles, there will be special considerations. The instructor will need to decide how to dispose of the articles--by sale or by giving them to a charitable institution. School policy should be determined. In a sale, the charge might reflect such things as cost of material, overhead, a nominal labor charge, and the approximate cost of the article if bought at retail or manufacturing costs.
4. In the case of service jobs, such as repairing an individual's car, similar factors are considered when setting a price.
5. In all jobs involving customers, there are special considerations. Will the school be accused of competition with workers in the community? Does the customer know learners are doing the work and that there may be mistakes, inexpert finishes, and delays in delivery?
6. A production job done for a specific customer may require a definite business procedure with a written order, specifications, contract, records, and other items.
7. If the training takes place in an industrial plant, it may be necessary to make special arrangements for insurance on the learners.

INSTRUCTOR'S LESSON PLAN

Related Technical Information

SUBJECT: Shop and classroom organization and management

AIM: To acquaint the occupational instructor with his management responsibilities and some recommended ways of meeting those responsibilities.

MATERIALS: Handout Sheet 31. Paper for written test.

I. PREPARATION of learner

Good management by the occupational instructor in his classroom or shop is almost as important as sound teaching techniques. Good management can do two things in a training situation: It can make the training go more smoothly with a minimum of unpleasant incidents or accidents, and it can influence trainee attitudes toward safety, neatness, work standards, organization of time, and working with other people.

II. PRESENTATION of information

A. Managing the physical facilities

Details on how to set up and manage particular types of shops for training may be obtained from the vocational divisions of state departments of education, from local school authorities, or from the local committee. The following factors are important in any training situation. They affect safety, ease of learning, and trainee attitudes.

ALL ROOMS should have:

1. **SUFFICIENT SPACE** for the intended activity.
2. **ADEQUATE LIGHT**, determined by type of activity. Some occupations require more light than others.
3. **ADEQUATE VENTILATION**, taking into account any dangerous fumes.
4. **ADEQUATE HEAT AND COOLING**.
5. **ELIMINATION OF UNNECESSARY HAZARDS**.

CLASSROOMS AND SHOP AREAS should have:

1. **VISIBILITY**, enabling all learners to see instructor while he presents a lesson or makes an announcement.
2. **CLEANLINESS**, meeting the highest standards of the occupation.
3. **ORDERLINESS**, meeting the highest standards of the occupation.
4. **WORKPLACES ARRANGED AS IN THE OCCUPATION**. Realism in training is vital. Workplaces should be arranged like those in an efficient and correctly operated plant.
5. **CLEAR AISLES**, so trainees can leave room quickly in an emergency.

STORAGE AND AUXILIARY AREAS should

1. Be **EFFICIENTLY ORGANIZED**, so that materials, supplies, and tools can be reached easily. Items used most often should be most conveniently placed.
2. Offer **POSSIBILITY OF A "VISUAL" INVENTORY**. For example, the place of each tool on a storage board can be marked so that the instructor can tell quickly which have not been returned after a shop session.
3. Have **ENOUGH BINS, RACKS, SHELVES, and HOLDERS** to minimize damage from stacking and moving about.

4. Provide SYSTEM FOR CONTROL of flow of items in and out of storage area. This provides a training situation similar or identical to that used in the occupation.

5. Assure PROTECTION AGAINST THE FT.

B. Managing tools and equipment

The management of tools and equipment is vital both to protect the property under the instructor's care and to develop a desirable attitude on the part of trainees. These recommendations will help meet both objectives:

1. ESTABLISH RESPONSIBILITY for specific tools and equipment. In some cases, certain tools may be checked out to individual trainees and kept at their workplaces throughout the course. Locked individual storage is desirable. Often, a centrally located tool crib is used either for all tools or for more expensive tools or equipment which is used less often. An inventory is needed, as well as a system for knowing who has each tool at all times. Many instructors rotate the assignment of tool crib attendant--the person responsible for checking tools in and out. The tool crib attendant job should be treated as a training opportunity where the trainee may learn about tools and their maintenance during his assignment.
2. REPLACE BROKEN TOOLS AND PARTS.
3. KEEP TOOLS CLEAN AND PAINTED. They should be marked to indicate ownership.
4. KEEP TOOLS IN TOP OPERATING CONDITION.

C. Control of groups

Setting a definite routine and following it will make it easier to control a group of trainees. Decide and announce times for:

1. OPENING CLASS.
2. BREAKS for food, smoking, or rest.
3. CLEAN-UP when trainees straighten up and put away jobs, tools, and workclothes. It is important to provide enough time for put-away activity.

4. CLOSING CLASS.

In addition, make certain each trainee knows the specific attendance requirements. A system for reporting absences is necessary.

D. Orienting trainees to the shop situation

Just as you began this teacher training course with a short orientation session, you should also give your trainees orientation on the course they will be taking. Let them know:

1. Objectives of the training, both general and specific. Point out what they can gain by successful completion of the course and what standards they need to meet in skills, knowledge, and attitude. Because so much of a typical course is devoted to skills and knowledge, this may be the best opportunity to emphasize the importance of a good attitude in keeping a job.
2. Whom they should consult about particular problems.
3. What agencies are cooperating to give the training and why.
4. Their relationship to other groups if shop and classroom facilities are shared.
5. Their responsibilities concerning tool and machinery care, out-of-class study, and individual practice.
6. Their individual assignments to work stations, toolroom responsibilities, safety inspection teams, first-aid assistance, and cleanup squads.

E. Health and safety of trainees

The safety survey made before the first group session is just the first step in an instructor's never-ending safety responsibilities. Throughout training he must be alert to see that:

1. Trainees wear appropriate shop clothing, including protective goggles, safety shoes, hard hats, gloves, or aprons.
2. Trainees avoid horseplay and are not careless.
3. There are adequate safety measures in the use of chemicals.

4. There are proper ventilation and exhausting of any dangerous fumes. Cleaning fluids may kill if their fumes are inhaled.
5. Trainees use all safety equipment and guards on machines.

Physical factors that cause accidents are usually easier to spot than these human factors:

1. IGNORANCE
2. CARELESSNESS
3. FATIGUE caused by continuous work; high speeds; poor lighting, heating, or ventilation; or monotony
4. The WRONG ATTITUDE toward safety. Often a trainee's attitude can be traced to the instructor's attitude or example. If he does not use a safety guard on a saw, the trainee probably won't.

Actually, safety in an occupation is not an isolated subject. It is part of every operation and job taught, and at each step in an operation the instructor should stress the applicable safety considerations. This develops safety as an attitude.

To help in stressing general safety practices, the instructor may be able to obtain posters, films, or other teaching aids designed especially for the occupation being taught. It may be desirable for the instructor to learn certain fundamentals of first aid, such as the treatment for shock, bleeding, or suffocation. He must know where he can get help quickly.

The checklist on Handout Sheet 31 will help in deciding how well management responsibilities are being met by an instructor. [Distribute Handout Sheet 31.]

[Distribute Handout Sheet 32.] This sheet tells where an occupational instructor can get further information that will help him succeed.

III. APPLICATION of information [Oral Questions]

1. What are five factors which should be considered for all rooms?
Five factors are space, lighting, ventilation, heat and cooling, and elimination of hazards.

2. What are five factors involved especially in classroom and shop areas?
Factors are visibility, cleanliness, orderliness, workplace arranged as in the occupation, and clear aisles.

[Ask similar questions to cover other teaching points presented in Step II.]

IV. TEST [Written]

1. List four factors considered when evaluating storage areas.
Is storage efficiently arranged? Can a "visual" inventory be taken? Are there enough bins, racks, shelves, and holders to avoid stacking or moving about? Is there a system for control of flow of items in and out of storage area? Is there protection against theft?
2. List four factors considered important for all rooms.
Factors are sufficient space for activity; adequate light; adequate ventilation, particularly if any fumes are involved; adequate heat and cooling; elimination of unnecessary hazards.
3. Why is correct management of tools and equipment so important to the occupational instructor? Give two reasons.
It protects property under instructor's care and develops a desirable attitude on part of trainees.
4. List four things you should let the trainees know in their orientation to the training situation.
See Handout Sheet 31.

CHECKLIST OF ORGANIZATION AND MANAGEMENT RESPONSIBILITIES

ABOUT PHYSICAL SURROUNDINGS, ASK YOURSELF:

- Is there enough space? Light? Ventilation, with special provision for dangerous fumes?
- Is the room at a comfortable temperature for working or studying?
- Have hazards been eliminated?
- Can learners see the instructor from their seats or workplaces?
- Does the room meet the highest standards of cleanliness of the occupation?
- Does the room meet the highest standards of orderliness of the occupation?
- Are workplaces arranged as they would be in the occupation?
- Are aisles kept clear?
- Are storerooms organized efficiently, with most-used items conveniently placed?
- Is it possible to take a "visual inventory" in the toolroom, noting what tools or other items are missing at any time?
- Are there enough bins, racks, shelves, holders, and brackets to minimize damage from stacking or moving?
- Is there a system for controlling flow of items in and out of storage area?
- Is there protection against theft?

ABOUT TOOLS AND EQUIPMENT, ASK YOURSELF:

- Is it possible to know at any time who has and is responsible for each tool or item of equipment?
- If a tool crib is used, is it treated as a training opportunity for the tool crib attendant?
- Are all tools clean, painted, and marked to indicate ownership?
- Are all tools in top operating condition?

ABOUT CLASS ROUTINE, ASK YOURSELF:

- Does everyone understand clearly when class opens? When there will be breaks?
- When there will be time for cleanup and put-away activities? When class ends?
- Does each trainee know the specific attendance requirements he must meet?
- Is there an effective system for reporting absences?

HAVE YOU ORIENTED THE TRAINEES BY LETTING THEM KNOW:

- What they can gain by successful completion of the course?
- What standards they must meet in terms of skill, knowledge, and attitude?

That a good attitude is important for holding a job?
Whom to consult with particular problems?
What agencies are cooperating in the training program, and why?
Their relationship to other groups sharing shop or classroom facilities?
Their individual responsibilities for tool and machinery care? Out-of-class
study? Practice? Cleanup? Others?
Their assignments to work stations? Toolroom responsibilities? Safety
inspection teams? First-aid assistance?

ABOUT HEALTH AND SAFETY OF TRAINEES, KEEP ASKING YOURSELF:

Do they wear appropriate shop clothing? Goggles? Safety shoes? Hard
hats? Gloves?
Do they avoid horseplay and carelessness?
Are there adequate precautions in the use of chemicals?
Are there proper exhausting of dangerous fumes and proper general ventilation?
Are any of the cleaning fluids used dangerous?
Are the trainees using all safety equipment, including guards on machines?
Is safety emphasized in every job and operation taught, with safety and
necessary precautions taught for every step?
Is action being taken to counteract the human factors that cause accidents?
Ignorance? Carelessness? Fatigue caused by continuous work, high
speeds, poor lighting, heating, or ventilation? The wrong attitude
on the part of trainees?
Do you know fundamentals of first aid such as treatment for shock, bleeding,
or suffocation? Do you know where to get help quickly?
Is there some way you can use posters, films, or other teaching aids for
stressing general safety items? Have you tried to obtain such aids
from school authorities, companies, or people in the occupation?

**FINALLY, REMEMBERING THAT THE INSTRUCTOR'S EVERY ACTION TEACHES
SOME TRAINEE SOMETHING, ASK THIS:**

Are you setting a good example by your attitude toward safety and precautions?
Standards of workmanship? Efficient procedures? Orderly and clean
physical surroundings? The people you work with? Your job?

PUBLISHED MATERIALS FOR THE OCCUPATIONAL INSTRUCTOR

Publications for assisting the occupational instructor have been developed and made available by individual States as well as by the U. S. Government.

Available from the individual States for training in specific occupations are a large number of publications, including study guides, workbooks, course outlines, test books, instructor's guides, and others. A catalog listing these publications, together with information on how they can be obtained, is available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402. The title of the listing is:

**Curriculum Materials for Trade and
Industrial Education 1963**

(OE-84023-A)

35¢

The Office of Education, U. S. Department of Health, Education, and Welfare, has developed a series of suggested guides for training courses which may be of assistance in determining course content. Most of these guides are listed in a Government Printing Office publication entitled:

Education Price List 31 - 52nd Edition - May 1965

This free booklet is available upon request from the Superintendent of Documents, United States Government Printing Office, Washington, D. C. 20402. Order blanks are included in the catalog to facilitate ordering.

Curriculum materials are being developed regularly by the Division of Vocational and Technical Education. Publications that have become available since the issuance of the above mentioned catalog include:

Publications Available From Superintendent of Documents, GPO

Clothing Maintenance Specialist	OE-87005
Companion to an Elderly Person	OE-87006
Electronic Business Data Processing--	
Peripheral Equipment Occupations	OE-86010
Family Dinner Service Specialist	OE-87007
Forestry Aide	OE-87011
Highway Engineering Aide	OE-87009
Homemaker's Assistant	OE-87008
Hotel and Motel Housekeeping Aide	OE-87003
Instrumentation Technology	OE-80033
Landscape Aide	OE-87010
Management Aide in Low-Rent Public Housing	OE-87001

Supervised Food Service Worker
Visiting Homemaker
Automotive Service Specialist

OE-87004
OE-87002
OE-87015

Publications Available Through U. S. Office of Education Only

Course in Instrument Maintenance
Industrial Radiographer, The
School Shop and Laboratory Safety
Sheet Metal Worker

OE-86009